TORREYA

A Monthly Journal of Botanical Notes and News

JOHN TORREY, 1796–1873

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE

AND

PHILIP DOWELL

Volume VII.

NEW YORK

1907

Press of
The New Era Printing Company
Lancaster Pa.

THE TORREY BOTANICAL CLUB

OFFICERS FOR 1907

President,
HENRY H. RUSBY, M.D.

Vice Presidents,
EDWARD S. BURGESS, PH.D. L. M. UNDERWOOD, PH.D., LL.D.*

Recording Secretary,
C. STUART GAGER, PH.D.
Botanical Garden, Bronx Park, New York City.

Corresponding Secretary,
JOHN K. SMALL, PH.D.
Botanical Garden, Bronx Park, New York City.

Editor,
JOHN HENDLEY BARNHART, A.M., M.D.
Tarrytown, N. Y.

Treasurer,
CARLTON C. CURTIS, PH.D.
Columbia University.

Associate Editors,
PHILIP DOWELL, PH.D.
ALEX. W. EVANS, M.D., PH.D.
TRACY ELLIOT HAZEN, PH.D.
MARSHALL A. HOWE, PH.D.
WM. ALPHONSO MURRILL, PH.D.
CHARLES B. ROBINSON, PH.D.
HERBERT M. RICHARDS, S.D.
ANNA MURRAY VAIL.

Meetings the second Tuesday and last Wednesday of each month alternately at the American Museum of Natural History and the New York Botanical Garden.

PUBLICATIONS. Bulletin. Monthly, established 1870. Price $3.00 per year; single numbers 30 cents. Of former volumes only 24–33 can be supplied entire. Certain numbers of other volumes are available, and the completion of sets will be undertaken.

Memoirs. A series of technical papers published at irregular intervals, established 1889. Price $3.00 per volume.

Torreya. Monthly, established 1901. Price $1.00 per year.

All business correspondence relating to the above publications should be addressed to Carlton C. Curtis, Treasurer, Columbia University, New York City.

*Died November 16, 1907.

ERRATA, VOLUME 7

Page 8, 6th line from bottom, *for* recurring, *read* recurving.

Page 28, 2d line from bottom, *for* Smith, T. E., *read* Smith, J. E.

Page 32, 25th line, *for* colors, *read* colours.

Page 56, 25th line, *after* by, *insert* 8.

Page 72, 22d line, for *Juncus subterminalis*, read *Scirpus subterminalis*.

Page 197, 2d line from bottom, for *Cheilanthus* read *Cheilanthes*.

Page 213, 17th line, for *Crategus*, read *Crataegus*.

Page 223, 23d line, *for* Kauffmann, *read* Kaufman.

Dates of Publication

No. 1,	for January.	Pages 1–20.	Issued February 7, 1907.
No. 2,	February.	21–48.	February 28, 1907.
No. 3,	March.	49–68.	March 19, 1907.
No. 4,	April.	69–88.	April 15, 1907.
No. 5,	May.	89–112.	May 20, 1907.
No. 6,	June.	113–132.	June 19, 1907.
No. 7,	July.	133–156.	July 19, 1907.
No. 8,	August.	157–176.	August 21, 1907.
No. 9,	September.	177–192.	September 21, 1907.
No. 10,	October.	193–208.	October 18, 1907.
No. 11,	November.	209–224.	November 19, 1907.
No. 12,	December.	225–258.	January 15, 1908.

Vol. 7 January, 1907 No. 1

TORREYA

A Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE AND PHILIP DOWELL

JOHN TORREY, 1796–1873

CONTENTS

Published for the Club
At 41 North Queen Street, Lancaster, Pa.
by The New Era Printing Company

[Entered at the Post Office at Lancaster, Pa., as second-class matter.]

Vol. 7 No. 1

TORREYA

January, 1907

SOME AFFINITIES OF THE PHILIPPINE FLORA

By C. B. Robinson

While all of the botanical papers which have been issued from time to time by the Philippine Bureau of Science and its predecessors have contributed greatly to our knowledge of the flora of the islands, one of the most recent * contains an introduction of such exceptional interest as to call for special notice.

It is hardly too much to say, that at the beginning of the American occupation information on this subject was drawn almost entirely from two sources, the great collection made by Hugh Cuming in the years 1835–40, and the work of the resident Spanish botanists. Cuming is said † to have taken back with him to England about 130,000 sheets of dried plants, and he also introduced into cultivation a number of the more striking orchids. His collection numbers exceeded 2,400, but they were not exclusively Philippine, some coming from Singapore and the Malay peninsula, and a very few from Sumatra. So far as their distribution between these larger geographical areas is concerned, the facts have long been definitely known; and although many species from this source have been wrongly credited to the Philippines in the past, and occasionally still are, this part of the problem has no longer any difficulties for a careful student. A list further exists purporting to give the locality for each plant, but these data have been shown ‡ to be incorrect in so large a proportion of the few cases where other evidence was available that the list must be held unreliable as a basis for dividing the

* Elmer D. Merrill, New or noteworthy Philippine plants, V. Philipp. Jour. Sci. 1: Suppl. (3) 169-246. 15 Au 1906.

† Jour. Bot. 3: 325. 1865.

‡ Jour. Bot. 24: 59, 60. 1886.

[No. 12, Vol. 6, of Torreya, comprising pages 241–272, was issued December 15, 1906.]

archipelago into its floral provinces. Fortunately all necessity for depending on it is rapidly disappearing.

With the exception of Vidal and Loher, the Spaniards and the collectors other than Cuming have failed to furnish any substantial additional information on this point.

Blanco's *Flora de Filipinas*, of which the first edition appeared in 1837, described many species and even genera as new and identified the remainder with those of other regions. Many of his species and a few of his genera were good, but the descriptions were often incomplete and sometimes inaccurate, and long proved a stumbling-block in the path of European systematists, who attempted to correlate them with the Malayan and continental floras. One of Mr. Merrill's greatest achievements lies in the work done towards clearing up these species, and it may now be said that nearly all of them are at last satisfactorily known.

The most comprehensive treatment of this flora as a whole is the *Novissima Appendix*, published as a part of the third edition of the *Flora de Filipinas*. This is the work of two authors of very unequal merit. Naves, who did most of the monocotyledons, was capable of identifying and enumerating exotic species as Philippine, by the leaves alone or on the reports of the natives, even recording in a few cases orchids from the Andes or western Africa, although he failed to find a majority of those collected by Cuming on his own island. The other author, Fernandez-Villar, was evidently a man of profound ability, but in his determinations he constantly referred Philippine to Malayan or Indian species, wrongly in very many cases. Except where they had been represented in Cuming's and other collections and formed the bases of descriptions, he so far ignored the endemic species that he added a bare half dozen, whereas in the last four years some six or seven hundred have been published as new, and many others so diagnosed will doubtless appear shortly.

It should be remembered that these Spanish authors had either little or no material from outside for comparison, that they sent no specimens to outside herbaria to be named, and that if they preserved any material it has disappeared.

The only Spaniard to appreciate the necessity for such assistance

was Sebastian Vidal, who sent or took to Kew about 4,000 numbers, many of them gathered in the hitherto unexplored Benguet region of northern Luzon, whence have come so many of the most interesting recent discoveries.

These and the other rich collections in the Kew herbarium enabled Rolfe,* in 1884, to publish what has been till now the only important paper upon the affinities of the Philippine flora.

In the meantime explorations elsewhere have done much to reveal the secrets of the most nearly related regions. This is notably true of Henry's large collections in central and western China and in Formosa, and of Koorders' work in Minahassa, or northeastern Celebes. But the results of Loher's splendid Philippine collections have never been published, except as regards occasional groups.

The great energy with which exploration has been carried on in many districts in the Philippines and the large quantity of material thus obtained, have made it possible for Mr. Merrill to preface the paper here noted with a discussion of two sets of affinities, those with Celebes on the south, and those with Formosa, China, the Himalayas, and Japan on the north and west.

From his enumeration it appears that there are now over 50 species known from the Philippines and Celebes and nowhere else, and another 25 that extend from the Philippines through Celebes to more distant islands. Several further cases are cited where Philippine species have striking affinities with those of Celebes but fall short of specific identity. It may be worth noting that although some of these belong to the southern Philippines, others are widely distributed throughout the archipelago.

Far different is the case with the northern or semi-tropical affinities, for these with few exceptions are found in the flora of the Benguet and Lepanto-Bontoc provinces, the mountainous regions of northern Luzon. This list is so much more complicated in its nature that it is not easily summarized; but again over 50 species are known to be specifically identical with those of more northern countries, and an equal number of additional cases are cited where affinities lie definitely in this direction.

*Jour. Linn. Soc. **21**: 283–316. *pl. 10.* 1884.

The large collection made for the New York Botanical Garden by Mr. R. S. Williams bears similar testimony to these facts; and the present indications seem to be, that when northern Luzon is fully explored, the most numerous cases of specific identity may be as would be expected with Formosa, but the more interesting and instructive cases with the hill district comprising part of southwestern China and northeastern India.

Bornean relationships are not discussed, owing doubtless to the less advanced state of exploration in Mindoro and Paragua than in Luzon and Mindanao, but these should prove equally interesting.

NEW YORK BOTANICAL GARDEN.

COASTAL-PLAIN AMBER

By Edward W. Berry

Recent discussions of the occurrence of amber in the Cretaceous deposits of the Atlantic coastal plain seem to have overlooked the fact that amber was well known to some of the earlier geological explorers in this region and is frequently mentioned from a number of different localities. Professor John Finch, an Englishman, who visited southern Maryland as well as parts of the intervening region northward as far as Marthas Vineyard during the first quarter of the last century, seems to have been a keen observer and close thinker. On the eve of his departure for England he read a paper before the Philadelphia Academy which was subsequently published in the *American Journal of Science* under the title "Geological Essay on the Tertiary Formations in America." * Aside from the distinction of casting discredit on the term "Alluvial" which had been applied to the coastal plain deposits collectively, his essay contains a number of interesting suggestions such as that relating to the extension under Long Island of the equivalents of the Plastic clays of New Jersey. The present Cretaceous deposits are included in his "Plastic Clay and Sand Formation" which he considered of Tertiary age, one of his reasons for this being the presence of amber which he assumed

*Amer. Jour. Sci. 7: 31–43. 1824.

to be of the same age as that of the Baltic. In speaking of the amber, which was my reason for mentioning Finch's work, he says that the lignites of the Plastic Clay and Sand Formation usually contain it, and among the localities mentioned are Marthas Vineyard, the Delaware River below Bordentown, N. J., Cape Sable, Md., etc. Some of these localities Finch visited, some he reports on the authority of Troost, Vanuxem, and others.

In a recent paper * the writer mentioned amber as constituting one of the characteristics of the laminated lignitic beds which mark the transition to the typically marine deposits of Upper Cretaceous age. These laminated clays and sands constitute what is known as the Magothy Formation, the name having been suggested by the typical exposures at Cape Sable on the Magothy River in Maryland, the classic American amber locality, first described by Troost nearly one hundred years ago (1821) in the third volume of the *American Journal of Science*.

It is not intended to attempt an exhaustive enumeration of the older literature, which has already been done †; it will suffice to point out that scattered through the works of Vanuxem, Morton, and other contemporary writers will be found quite a number of references to the occurrence of amber, most of which seem to have heretofore escaped attention.

In studying these Cretaceous deposits during the past few years the writer has observed amber at a number of points, of which the following may be enumerated. In New Jersey, amber was found at Cliffwood Bluff on Raritan Bay; at the pits of the Cliffwood Brick Company on Whale Creek; in the pits about one-fourth of a mile west of the Long Branch Railroad on Whale Creek, where there is little lignite associated with it; near Morgan on Cheesequake Creek, where the amber is very plentiful and the drops are of considerable size. On the Delaware River amber is disseminated through the Magothy sands in the vicinity of Kinkora, N. J.

In Delaware, the sands along the Chesapeake and Delaware

* Ann. Rep. State Geol. N. J. 1905: 137. 1906.

† Hollick, Amer. Nat. 39: 137–145. 1905.

Canal near High Point contain scattered drops of amber; and here again it is not in immediate association with lignite, although lignitic layers are near at hand. This locality is believed to be the only one mentioned in this connection which is not new, it having been described in 1830 by Morton, who records lignite and teredo-bored logs and amber beneath sands with marine molluscs, found during the digging of this canal. Farther south, amber occurs in the Cretaceous near Blackmans Bluff on the Neuse River and near Parker Landing on the Tar River, both localities in North Carolina. At nearly all of these localities charred wood seems to be present in more or less abundance, as was noticed by Hollick in connection with the Staten Island deposits. Extensive search in the Raritan Formation of New Jersey during the past summer, while disclosing much lignite and some charred wood, failed to yield any traces of amber, which seems to be so common a feature of the overlying Magothy beds.

MARYLAND GEOLOGICAL SURVEY,
BALTIMORE, MD.

SHORTER NOTES

TWO UNDESCRIBED SPECIES OF COMOCLADIA FROM JAMAICA.—**Comocladia cordata** sp. nov. A tree, about 15 m. high, glabrous throughout. Leaves about 2 dm. long; leaflets about 13, ovate to oblong-lanceolate, firm in texture, dull green, slightly paler beneath than above, strictly sessile, entire-margined, cordate at the base, acute or short-acuminate at the apex, 5–9 cm. long, 2.5–4 cm. wide, the veins diverging from the midvein at nearly right angles and curving upward; lower leaflets smaller than the upper ones, the pairs distant; panicles as long as the leaves or shorter, about 8 cm. broad, their branches very slender; flowers numerous, purple, 1.5 mm. wide; pedicels filiform, 1–3 mm. long.

Rocky wooded hill, Troy (Britton *640*). Nearest to *C. integrifolia* Jacq.

Comocladia velutina sp. nov. A tree, 6 or 7 m. high, the young twigs, foliage and panicles densely brown-velutinous. Leaves about 2 dm. long; leaflets about 13, oblong, rather firm in texture, paler beneath than above, blunt and rounded at the apex, truncate or subcordate at the base, slightly repand on the

margin, 2–7 cm. long, 4 cm. wide or less, very shortly petioluled, the lower pairs much smaller than the upper; petiolules 2 mm. long; panicles as long as the leaves or shorter, the branches slender; flowers dull crimson; fruits oblong, very shortly stalked, 1 cm. long, 6 or 7 mm. in diameter.

Great Goat Island (Harris *9208*). Perhaps nearest related to *C. pubescens* Engler.

N. L. Britton.

A new blackberry from Massachusetts and Rhode Island. — On August 1, 1906, I found a new blackberry in Rehoboth, Massachusetts. It is decumbent but has a large, strong, angled stem, is fearfully armed and well branched. The station is near the Seekonk line on the trolley from Providence, R. I., to Taunton, Mass. It is abundant over an acre or more of rich land, now in pasture, and holds its own well in spite of the vigorous trimming given it by the cows. But I found no more in that locality except one plant in Seekonk. Two days after, however, I found it at Rocky Point, R. I., near the junction of the electric roads. Here it was very abundant, just ripe, and the excursionists found it good eating. The pastures and mowings, unused but "for sale," make it a good home. The fruit is abundant, of good size and flavor. Care is required, however, in walking in such lots, for the strong branches are continually tripping one, and the strong prickles take hold. For four miles it occurred along the road to Providence, the last station being in a pasture. Darkness stopped the search. Afterward I found it in Portsmouth, R. I.; in Massachusetts, at Fairhaven, near the garden of H. H. Rogers, the oil magnate, and very abundant on his grounds, also at Wilbur Point; at Mattapoisett, on the electric road, while waiting at a switch west of the village; in Bridgewater, in a pasture near the Normal School; and in Plymouth, beyond Hotel Pilgrim.

Rubus multispinus sp. nov.

New canes. — Stems green, large and strong, often 0.375 inch in diameter, 4 to 8 feet long, nearly erect at first, soon decumbent and partly trailing, with numerous long branches, glandless but slightly pubescent, none noticed tipping. Prickles for-

midable, numerous and large, about 13 to an inch of stem, 0.25 inch long on the main axis and set at a pronounced backward slant, smaller on the branches and often hooked, set in lines more or less regular on the angles. Leaves large, mostly 3-foliolate, many or all on the main axis and often some on the branches 5-foliolate, yellow-green, with abundant appressed hairs on the upper surface, quite pubescent below. Leaflets broad, the middle one often nearly orbicular, short-pointed, the side ones also broad and more or less 1-incised, or if divided the side leaflets rhomboidal and pointed at each end and the basal ones similar but smaller; outline finely somewhat doubly serrate-dentate, otherwise nearly entire. Petiole and petiolules large, grooved, somewhat pubescent, strongly armed with three rows of numerous very stout and hooked prickles, which are continued into the point of the leaf, the petiolule of the middle leaflet often 1 inch long, the other leaflets nearly or quite sessile.

Old canes. — Stems greenish, stout, hard, prickles intact. Second year's growth consisting of short fruit-branches from 7 inches to 2 inches long, well graded, tipped with inflorescence, one from each old leaf-axil, axis of branch zigzag, angled, fine-hairy, armed with short, stout, hooked prickles. Leaves not numerous, the lower 3-foliolate, the upper unifoliate; leaflets rather broad, very coarsely serrate-dentate, often incised-dentate, the unifoliate ones often 2-incised, similar in color and pubescence to those on new canes. Inflorescence cymose-racemose, of 4 to 8 flowers on stout pedicels, fine-hairy, well armed with hooked prickles. Flowers not seen. Fruit ripening early in August, abundant, short-cylindric with large drupelets; a large one measuring 0.75 inch high by 0.69 inch broad and having 30 drupelets, each 0.22 inch in diameter. Type station: Rocky Point, Rhode Island.

In open dry places.

This species has the appearance of a high blackberry in its leaves and angled stem, round stems being commonly characteristic of recurring and decumbent forms. It trails over walls and fences and alone makes a low hedge of the densest kind. The fruit is ripe considerably earlier than that of *R. Andrewsianus* Blanchard and much earlier than that of *R. alleghaniensis* Porter.

W. H. Blanchard.

Westminster, Vermont.

REVIEWS

Juvenile Forms and Flower Maturity *

During a residence in West Australia, Diels found the relation between vegetative growth and generative maturity subject to change and became acquainted with the conditions that correspond to the phases of these changes. He found a large number of cases in which flowering occurred in juvenile forms. A search in the literature showed that this "abnormality" is far-reaching and calculated "to throw light upon a new side of form-diversity in the plant kingdom."

His book does not attempt a complete enumeration of such cases but endeavors, by typical examples, to illustrate the many-sidedness of the question.

The first chapter, entitled, "*Die Bedingtheit der Blütenreife*," discusses various explanations that have been offered as to the conditions of flowering. The older theory of Moebius (1847) was that every plant species which, through heredity, possesses fixed characters, produces flowers at a definite age or phase of its development. Diels, however, agrees with the view more recently expressed by Klebs (1904), "that flower formation by phanerogamous plants presents the same problem in principle as does the sexual reproduction of algae, or the fruiting of the higher fungi. * * * "I hold," says Klebs, "that a quantitative increase of the concentration of organic material with all its physical and chemical consequences plays an important rôle in the transition from growth to reproduction." "The external circumstances," says Diels, "either inhibit or accelerate, according as they interfere with or favor, the internal conditions necessary to flowering." Experimental researches on the problem have been few, but Diels believes that a new review of the cases hitherto published of flowering in a very early developmental stage will not be without its value.

Chapter II, "*Das Verhältniss der Blütenreife zur vegetativen Entwickelung in seiner Wandelbarkeit*," gives citations from literature, presenting cases illustrating the relation of flowering to

*Diels, L. Jugendformen und Blütenreife im Pflanzenreich. Pp. 1–130. *f. 1–30.* Berlin: Gebrüder Borntraeger. 1906.

vegetative development in its changes. The cases cited indicate that there is a "vast independence of generative maturity and vegetative growth. Of course a definite 'nutrition-minimum' is absolutely necessary. Beyond this, the way for generative maturity, flowering (*Die Blütenreife*), arises independently. Every favoring constellation is able to induce it, even though vegetative development be insignificant, and though the age be juvenile. Practically, all cases of 'early blooming,' or on the other hand of 'nanism,' signify how flowering is favored 'by dryness or by the disturbance of the nutrition conducive to growth.'"

In Chapter III, "*Helikomorphie und Blütenreife bei heteroblastischen Pflanzen*," the author refers to Goebel's classification of development into "heteroblastic," where the differences between the configuration of the plant at different stages in its vegetative development are very small, and "homoblastic," where these differences are large. Goebel, in his "Organography," has already pointed out that no sharp line can be drawn between homoblasts and heteroblasts. Juvenile forms (*Jugendformen*) and subsequent forms (*Folgeformen*) have been recognized. Diels proposes to apply to both the general term "helikomorph." "I call a form a '*helikomorph*,'" he says, "which appears at a definite phase of vegetative development, that is, at a definite (relative) age (Gr. *ἡλικία* = age)." The term signifies, in general, the vegetative configuration dependent upon the phase or age.

Helikomorphs are classed as: 1. Heteroblasts with arrested primary leaves; 2. Heteroblasts with arrested subsequent leaves (*Folgeblättern*); 3. Heteroblasts with helikomorphs of indeterminate characters. The greater portion of the book (pp. 23–108) is occupied with illustrations of the various classes, under the subheads, (*a*) cases conditioned by external conditions (*exogener Bedingtheit*), including seasonal dimorphism; (*b*) cases whose conditions are unknown.

The phylogenetic significance of helikomorphs is discussed in Chapter IV. "After the attainment of a certain minimum of vegetative preparation, flowering can occur in very diverse phases of development and bring about the termination of vegetative unfolding."

"When this happens within heteroblastic species or genera, then there follows a corresponding difference in the entire morphological expression of the individual forms. We rank these forms as individual variations if observation or experiment demonstrates their connection with the 'normal.'" (*Limosella* presents an example of this.) "We call them species if such experience is wanting. But often these standards are uncertain." One recalls very distinctly an example in the case of *Campanula rotundifolia.* Of their early-blooming form, Goebel rightly says, they would, "in another botanical district and occurring in larger number, be considered without hesitation as a different species from *Campanula rotundifolia.* There is not the slightest doubt but that in fact many so-called 'species' bear the same relation to other species as the Schleissheim *Campanula* (p. 86) does to the 'normal' plants, that they also stand mutually in the relation of helikomorphic forms."

"Often phase-forms prove themselves to be 'epharmons' (*Epharmosen*). Theoretically they must quite frequently begin as such, because the relation between vegetative growth and reproduction is so labile, and because external conditions are in continual change."

"In each case these epharmonic phase-forms will endure as long as the determinative conditions remain nearly similar. They may, indeed, exist under circumstances of very long duration. And thereby they acquire the possibility of becoming fixed through heredity and of losing more and more the primary strict dependence upon external circumstances."

"This case has found realization in many similar forms. * * * The Australian acacias form their phyllodes even in our houses. I have seen examples of *Eucalyptus Risdoni* that escape from culture of European gardens and bear inflorescences as in their home locality."

"Heredity has also been demonstrated in the case of the 'seasonal dimorphic' species. Von Wettstein has cultivated *Euphrasia Rostkoviana* and *E. montana* through three years in the botanical garden at Prague under entirely similar external conditions. The two plants proved themselves fully constant in

all their characters, in their whole behavior." (Ber. Deutsch. Bot. Ges. 13: 307. 1895.) "Now if Von Wettstein's plausible assumptions concerning the established causes of this dimorphism are correct, then even the state of heredity is here a relatively very young epharmon (*Epharmose*): for only since the development of an alpine habit (*Alpenwirtschaft*) through regular mowing would the effective forces have been in action. If only a phylogenetically considered short period suffices in this case to fix the form as hereditary, by how much more would nature itself, which operates over such immeasurably long periods, be in a condition to do it. Through heredity numerous helikomorphic structures obtain that independence which establishes new phyletic courses for their posterity. They become, then, 'phylembryos' of new developmental courses. Their leaf-form, fixed in a definite direction, undergoes either epharmonic or autogenous variations, a new strain is developed out of the former phase-form of the old stock."

Chapter V treats of similar phenomena in the animal kingdom, and Chapter VI is a résumé of the preceding chapters. The following is a free translation of Chapter VI, with omission of the examples cited:

"The generative maturity of plants is not unchangeably bound up with a definite stage of vegetative development. Of course it presumes a certain minimum of previous vegetative work; if this is exceeded, however, there follows *a broad zone of variation for the appearance of the flowers.* The regulation of this variation takes place by means of complex and diverse conditions. *External circumstances* have an important share in it, in the case of cryptogams (Klebs) as well as in the case of flowering plants. Of this we know but little; but it is manifestly evident that *dryness and a qualitative variation of nutrition favor flowering, opposite conditions are unfavorable.*

"The vegetative ontogeny of plants is consummated through the coöperation of autogenous and external (*exogener*) factors. The ground work comprises diverse potentialities. Thus it postulates no rigid configuration. At first the environment is rather 'the determining factor as to which of the various possible

developmental forms becomes realized.' *This regulation by means of the environment is clearly realized in the case of heteroblastic ontogenesis.*

"As in the case of flowering, the insight into the associations which we have hitherto obtained is rather limited. But we see that the organization of subsequent leaves (*Folgeblätter*) becomes more abundant if heat and moisture are increased. And we recognize a restriction in this respect by shortening the growth period, by dryness, and by a lowering of the temperature.

"Thus ontogeny varies with the quality and degree of external factors. The finished figure of the organism is the product of vegetative ontogeny and of flower-maturity: and *both factors are variable.*

"And furthermore their variability is not of the same kind nor similarly ordered. Of course the vegetative form-development ceases for the most part with flowering; but that is a stage, however, where the two courses of development, the vegetative and the generative, are indissolubly connected. Otherwise they are free and independent of each other. Their relation is capable of every variation. The leaf-succession in its phase (helikomorphy) varies after its own fashion. Flowering varies in its own way.

"In this combination of two variable factors into the unity of the flowering form, lies a powerful impetus to the increase of form-diversity in the plant kingdom. For the circumstances that help to regulate the leaf-succession and flower-maturity vary with the change of climate in time and place. In their ultimate effects they produce the geographically local races (*Arten*) and in the course of time favor the development of new species. Their product attains to heritability, and thereby new strains with new possibilities become established.

"In this relation of consecutive vegetative stages and flowering, it is expressed with clear emphasis how endlessly variable form is in the plant kingdom. Even the few external factors that we perceive, produce an interminable maze of possibilities. We are led indeed to the confession to which Klebs was led in another connection: 'The typical or customary development

signifies only a small, limited portion of the complement of possible forms.' Such utterances, often enough already expressed, are, notwithstanding the clear conception of species of our day, still far remote from fruitful effect."

The book, on the whole, is very suggestive along several lines. It the first place, it shows how possible it is to arrive at new and possibly important results merely by a reëxamination and reconsideration of the rich material already collected both in herbaria and in published literature. In the second place, it emphasizes the great desirability of collecting and preserving in herbaria unusual or abnormal forms, as well as so-called "typical" specimens. In the third place, it gives emphasis to the value and absolute need of experimental pedigree culture, at least as ancillary to morphological and systematic work, for the reason that origin of species is more a physiological than a morphological problem, and can never be solved by employing alone the methods of comparative anatomy.

Finally, added importance is attached to the "heliokomorphs" as material upon which selection may act in the development of new groups of the rank of species. In this connection, also, the question of the heritability of acquired characters is forced once more to the front.

The burden of proof still lies with those who deny that species of plants as well as of animals, are formed in more than one way. As has been recently often stated, it is only by a combination of ecological and physiological studies that we may hope for a proper interpretation of the facts of comparative anatomy and ultimately of the method of organic evolution.

C. Stuart Gager.

Postelsia, reviewed in Torreya 6: 250. December, 1906, may be obtained from Professor Josephine E. Tilden, University of Minnesota, Minneapolis, Minn.

PROCEEDINGS OF THE CLUB

November 13, 1906

The meeting of Club was called to order by President Rusby at 8:15 o'clock, at the American Museum of Natural History. Thirteen persons were present.

After the minutes for October 31 were read and approved, the name of Dr. H. E. Hasse, of Santa Monica, California, was proposed for membership.

The resignation of Mrs. Ada Watterson Yerkes, Cambridge, Mass., was read and accepted. On motion the secretary cast the vote of the club electing Dr. H. E. Hasse to membership.

The resignation of Dr. N. L. Britton, as chairman of the program committee, was read and accepted, and the chairman appointed Dr. M. A. Howe as chairman of that committee. The other members are Professor L. M. Underwood and Mrs. E. G. Britton.

The following scientific program was presented:

"Account of a Collecting Trip in the Adirondacks and in the Catskill Mountains," by Dr. Per Axel Rydberg. Dr. Rydberg gave an interesting account of botanical field studies and collecting in the regions mentioned, giving special attention to the blackberries. The talk was richly illustrated by herbarium specimens collected on the trip.

Dr. Augustine Henry, of London, who was visiting New York, gave a very interesting account of some features of the flora of China, pointing out its richness and great diversity, which are correlated with diversity of topography and climate, and emphasizing both the slight amount of collecting that has as yet been done there and the important results to be obtained by ecological and systematic studies in that region. As an illustration he called attention to the fact that several genera recorded in existing manuals as monotypic are known to be represented in China by several distinct species.

Adjournment was at 10 o'clock.

C. Stuart Gager,
Secretary.

November 28, 1906

The Club met at the museum building of the New York Botanical Garden, at 3:30 p. m. In the absence of President Rusby, Dr. L. H. Lighthipe was called to the chair. Twenty-two persons were in attendance.

The minutes for November 13 were read and approved, and the following names were presented for membership :

Ulysses O. Cox, Terre Haute, Ind.

Harold W. Pretz, 368 Union St., Allentown, Pa.

The amendment to Article XIV of the Constitution relating to annual dues, presented at the regular meeting of the Club on October 31 and published in the weekly Bulletin of the New York Academy of Sciences and Affiliated Societies for November 19, 1906, came up for discussion. After a brief discussion it was voted to lay the motion on the table.

The secretary read a communication to the president of the Club from the member for botany of the committee of the New York Academy of Sciences appointed to arrange for an exhibit to be held at the American Museum of Natural History, on December 28 and 29, to illustrate recent advancement in different departments of science. The Club was invited to send material for the exhibit. On motion the secretary was appointed to arrange for the Club's participation in the exhibit.

On motion it was voted to omit the second regular December meeting of the Club which would fall on the 26th of the month.

The following scientific program was presented : "Some Costa Rican Orchids," by Mr. George V. Nash.

The speaker referred to the little-known country of Costa Rica and the desirability of securing material from there. Mr. Wm. R. Maxon, of the United States National Museum, during the early part of the year, made an exploration in this region in the interests of the New York Botanical Garden and brought back with him not only a valuable collection of herbarium material but also a large collection of living plants, representing mainly the orchid, fern, bromeliad, and cactus families. This material, owing to the care taken by Mr. Maxon in collecting and packing it, arrived in excellent condition. A great many orchids

were among the lot, and several of these have already flowered, revealing new and interesting species. Living material is especially desirable in this family of plants, as the color and shape of the flowers play a large part in their classification, and these characters are difficult to determine from dried material. The genera *Pleurothallis*, *Elleanthus*, and *Zygostates*, have each already yielded one species new to science. The new species of *Zygostates* is a particularly interesting discovery, as it not only proves to be a species hitherto unknown but also brings into the flora of North America a genus known formerly only from Brazil and Peru. Among other things worthy of note are : *Warscewiczella Wendlandi discolor*, originally described and known only from Costa Rica ; *Maxillaria iridifolia*, found throughout tropical America but certainly differing much in general appearance from the other members of the genus ; and *Cycnoches Rossianum*, originally described from a plant that flowered in cultivation in the Garden of Mr. Ross, at Florence, Italy, in 1889. The origin of this plant was unknown, and it is now interesting to have its home revealed by this collection of Mr. Maxon's. The remarks were illustrated with living plants of the species referred to, supplemented with herbarium specimens, drawings, and material preserved in formalin.

"The Sedges of Jamaica," by Dr. N. L. Britton.

Dr. Britton exhibited specimens of all species of Cyperaceae known to occur on the island of Jamaica, including several species new to that island, collected by Professor Underwood or by himself during a visit to Jamaica in the month of September. He remarked on the distribution of many of these species and on the fact that a number of them are found in the West Indies, only in Jamaica, their further distribution being in Central and South America. This distribution of these sedges is paralleled by that of a considerable number of species in other families, so that the South American relationship of the Jamaica flora is more intimate than that of Cuba, Hayti, or Porto Rico, and it is suspected that this may be an indication of a former land connection between Jamaica and the continent to the west or southwest. Dr. Britton's paper included a complete enumeration of the species now

known, together with diagnostic keys for their determination, and as much of their synonymy as relates to Jamaican records. No undescribed species were found, but the collections made by recent explorers added a number to those recorded by Mr. Clarke in his monograph of the West Indian Cyperaceae, published in the second volume of Professor Urban's "Symbolae Antillanae."

"Exhibition of Photomicrographs of North American Woods," by Dr. C. Stuart Gager.

Numerous specimens were shown from a collection of photomicrographs of cross-sections of North American woods, recently acquired by the Garden from Mr. James A. Weale, of the firm of Williams, Weale & Co., of Liverpool, England. These photomicrographs are all enlarged ten diameters, thus facilitating comparison. They are of very superior quality, so that many finer elements of the histology of the various woods can be demonstrated under a lens with nearly as great satisfaction as from the original sections. They possess the advantage of being less fragile than the sections themselves and of serving better than these for purposes of demonstration before classes and otherwise. The collection contains representations of practically all North American species.

By way of comparison, specimens were shown of Hough's "American Woods" and of Nördlinger's "Holzquerschnitte."

The Club adjourned at five o'clock.

C. Stuart Gager,
Secretary.

NEWS ITEMS

Dr. John A. Shafer has started on a collecting trip, for the New York Botanical Garden, to the West Indian island of Montserrat.

Dr. Marshall A. Howe returned to New York on January 30 from a botanical expedition to Jamaica. Six weeks were spent in collecting and studying marine algae in the vicinity of Kingston and Montego Bay.

Mr. E. S. Steele, of the United States National Museum, spent a few days, about the first of January, studying the herbarium material in the New York Botanical Garden.

At the annual meeting of the Torrey Botanical Club, on January 8, the officers of the preceding year were reëlected, and an additional associate editor was added to the editorial staff. An amendment was introduced to increase the number of associate editors to eight instead of seven.

A reception to visiting botanists was given at Schermerhorn Hall on Wednesday evening, December 26, 1906, by the Torrey Botanical Club. It was largely attended and highly successful.

The Board of Managers of the New York Botanical Garden entertained at luncheon the botanists attending the session of the Botanical Society of America held in the Museum of the Garden on Saturday, December 29, 1906.

The American Association for the Advancement of Science held its fifty-seventh meeting in New York City, December 27, 1906, to January 2, 1907. As has been the custom in late years, various affiliated scientific societies held sessions in the same city during the same week. Section G (botany) met in Schemerhorn Hall, Columbia University, on Thursday afternoon, December 27, on Friday morning, and on Monday, with the vice-president, Dr. D. T. MacDougal, in the chair. Dr. Tracy E. Hazen acted as secretary in the absence of Professor F. E. Lloyd. The Friday morning session was a joint one of Sections F (zoölogy) and G, devoted to the discussion of heredity. In the absence of the retiring chairman, Dr. Erwin F. Smith, his vice-presidential address was omitted. Professor Charles E. Bessey was elected chairman of Section G for the next meeting. About 125 botanists were in attendance at the sessions of the Section and of the affiiliated societies.

The Botanical Society of America met in New York City, December 27–31, 1906. The federation of the three societies, the Botanical Society of America, the American Mycological Society, and the Society for Plant Morphology and Physiology, was effected at the first session on Thursday, December 27. The president, Professor F. S. Earle, acted as chairman during the first day; as he was not able to be present at the later sessions, the chair was occupied by the vice-president, Professor Frederic E. Clements. Meetings for the readings of scientific papers were

held on Thursday, at Schermerhorn Hall, Columbia University; on Saturday, at the Museum of the New York Botanical Garden, when one of the papers was the address of the retiring president, Professor R. A. Harper, on "The Organization of certain Coenobic Plants"; and on Monday, at Schermerhorn Hall. In all, twenty-nine papers were presented. Officers of the new Botanical Society of America were elected as follows: Professor George F. Atkinson, president; Dr. N. L. Britton, vice-president; Professor D. S. Johnson, secretary; Dr. Arthur Hollick, treasurer.

The American Society of Naturalists held its twenty-fourth annual meeting in Schermerhorn Hall, Columbia University, New York City, on the afternoon of Friday, December 28, 1906. The scientific program consisted of a discussion of the biological significance and control of sex, and several of the papers viewed the topic from a botanical standpoint.

The Sullivant Moss Chapter held a meeting on Friday afternoon, December 28, 1906, in Schermerhorn Hall, Columbia University, the president, Mr. Edward B. Chamberlain, in the chair. In the absence of the secretary, Dr. John W. Bailey, Miss Edith A. Warner acted as secretary pro tem. There were exhibits by members of specimens and photographs, and a scientific program of six papers, by Professor A. W. Evans, Miss Annie Lorenz, Mrs. Elizabeth G. Britton, Professor Bruce Fink, Dr. A. J. Grout and Mr. R. S. Williams.

At the American Museum of Natural History, on the afternoon of Saturday, December 29, 1906, occurred the ceremonies attending the unveiling of the busts of American men of science, presented to the Museum by Mr. Morris K. Jesup. Among the busts unveiled was that of Professor John Torrey, and a brief memorial address upon the life and work of Dr. Torrey was delivered by Dr. N. L. Britton. Busts of Alexander von Humboldt and Joseph Leidy, both of whom contributed to the advancement of botanical science, although better known from their work in other fields, were also among the number.

THE TORREY BOTANICAL CLUB

TORREYA is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, fifteen cents. To subscribers elsewhere, five shillings, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to TREASURER, TORREY BOTANICAL CLUB, 41 North Queen St., Lancaster, Pa., or Columbia University, New York City.

Matter for publication should be addressed to

MARSHALL A. HOWE
New York Botanical Garden
Bronx Park, New York City

OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 32, published in 1905, contained 691 pages of text and 29 full-page plates. Price $3.00 per annum. For Europe, 14 shillings. Dulau & Co., 37 Soho Square, London, are agents for England.

Of former volumes, only 24–32 can be supplied entire; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Vols. 24–27 are furnished at the published price of two dollars each; Vols. 28–32, three dollars each.

Single copies (30 cts.) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–11 and 13 are now completed and Nos. 1 and 2 of Vol. 12 have been issued. The subscription price is fixed at $3.00 per volume in advance. The numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **The Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

THE TORREY BOTANICAL CLUB
Columbia University
NEW YORK CITY

Vol. 7 February, 1907 No. 2

TORREYA

A Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE AND PHILIP DOWELL

JOHN TORREY, 1796–1873

CONTENTS

Published for the Club
At 41 North Queen Street, Lancaster, Pa.
by The New Era Printing Company

[Entered at the Post Office at Lancaster, Pa., as second-class matter]

THE TORREY BOTANICAL CLUB

TORREYA is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, fifteen cents. To subscribers elsewhere, five shillings, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to TREASURER, TORREY BOTANICAL CLUB, 41 North Queen St., Lancaster, Pa., or Columbia University, New York City.

Matter for publication should be addressed to

MARSHALL A. HOWE
New York Botanical Garden
Bronx Park, New York City

Vol. 7 No. 2

TORREYA

February, 1907

JANE COLDEN, AN EARLY NEW YORK BOTANIST

By Anna Murray Vail

A few years ago Mr. James Britten published in the *Journal of Botany* (33 : 12. 1895) a sketch of the life of Miss Jane Colden, with a description of her MS. Flora of New York, which is preserved in the Department of Botany of the British Museum. This sketch was compiled from the numerous, but all too fragmentary, references to Miss Colden that are scattered through her father's correspondence and elsewhere in biographies of the period, and is most entertaining reading.

It is with the object of adding a few more facts to those collected by Mr. Britten, as well as to make known something about the first botanist of her sex in the state, that these notes are offered to the Club.

Jane, the second daughter of Lieutenant-Governor Cadwallader Colden, was born in New York, March 27th, 1724. Her father was the son of the Rev. Alexander Colden, minister of Dunse, in the Merse Berwickshire, Scotland. He received his education at the University of Edinburgh, with a view to entering the Church of Scotland, but, his tastes turning in other directions, he devoted himself to the study of medicine. Owing to limited means, his father was unable to assist him in starting a career at home, so he came to this country in 1710 to try his fortune in America, as he himself puts it in a letter to Kalm. Here he settled in Philadelphia, residing with a widowed sister of his mother's, who had established herself there, and began the practice of his profession. That his affairs did not prosper to his satisfaction or that he had a taste for adventure is evinced by the fact that we hear of him as trading in the colonies and in the West Indies.

[No. 1, Vol. 7, of Torreya, comprising pages 1–20, was issued February 7, 1907.]

In 1715 he returned to England and "in pursuance of the main object, probably, of his visit to his native land," he went to Scotland, where, in November of the same year, he married Alice Christy. The following year saw them both in Philadelphia, and in 1718, accepting the offer from Governor Hunter of a position as master in chancery and surveyor-general, Dr. Colden fixed his residence in New York.

In 1719 a patent for 2,000 acres of land situated in Ulster County was issued to him, and shortly after he procured another thousand acres adjoining the first, and to this manor he gave the name of "Coldengham," still known to-day as Coldenham, in the town of Montgomery, Orange County.*

The details of his active life are too well known to be recounted here. Suffice it to say that about this time Governor Hunter offered him a small stipend for the compilation of a list of the plants and animals of New York. This work was to be pursued on his surveys, but, owing to extensive cutting down of expenditures in the province, it was not carried out. As regards the flora of the state as a whole, this was only accomplished nearly a hundred years later with the publication in 1814 by Jacob Green of his "Catalogue of the Plants Indigenous to the State of New York," and later by the more complete and detailed works of John Torrey, published 1840–43.

In 1728 Dr. Colden with his wife and six young children removed to Coldengham, being led thereto among other reasons "to secure in the — then wilderness abode that leisure for philosophical study to which he was so much inclined."

It was during his residence there for more than thirty years that he maintained a most voluminous correspondence with a number of learned men in Europe. In the intervals of political and literary pursuits he devoted himself to the reclamation and cultivation of his estate, and, with his accomplished wife, to the education of their children. It was here that he wrote that first of "local floras" of New York, the "Plantae Coldenghamiae," eventually published by Linnaeus, with whom he had been in

---

* Purple, E. R. Genealogical Notes of the Colden Family in America. New York; privately printed, 1873.

Cadwallader Colden

[From the Historical Magazine, volume 9, January, 1865.]

correspondence, in the "Acta Societatis Regiae Scientiarum Upsaliensis," in 1749, and here Jane grew up and acquired that taste for natural history of which her father wrote in the oft-quoted letter to Gronovius. The portions of this letter which refer to Jane are here printed as copied from the original draft:*

"TO DR. JOHN FREDERIC GRONOVIUS

Senateur de la Ville de Leiden.

New York Oct. 1st, 1755.

* * * "I (often) thought that Botany is an amusement which may be made greater to the Ladies who are often at a loss to fill up their time (& that) it could be made agreable to them (it would prevent their employing so much of their time in trifling amusements as they do). Their natural curiosity & the pleasure they take in the beauty & variety of dress seems to fit them for it (far more than men). The chief reason that few or none of them have hitherto applied themselves to this study I believe is because all the books of any value are wrote in Latin & so filed with technical words that the obtaining the necessary previous knowledge is (attended with) so (much) tiresome and disagreable that they are discouraged at the first set out & give it over before they can receive any pleasure in the pursuit.

"I have a daughter, who has an (natural) inclination to reading & a curiosity for natural philosophy or natural History, & a sufficient capacity for attaining a competent knowledge. I took the pains to explain Linnaeus's System (for her), and to put it in English for her use by freeing it from the Technical terms, which was easily done by useing two or three words in place of one. She has now grown very fond of the study, and has made such progress in it that as I believe would please you if you saw her performance, tho' perhaps she could not have been persuaded to learn the terms at first, she now understands in some degree Linnaeus' characters, notwithstanding that she does not understand Latin. She has already a pretty large volume in writing of the Description of plants. She was shown a method of taking the impression of the leaves on paper with printers ink, by a simple kind of rolling press which is of use in distinguishing the spe-

* Colden MSS. in the New York Historical Society. For permission to examine some of these MSS. I am indebted to the librarian of the New York Historical Society.

This letter is somewhat differently printed in "Selections from the Scientific Correspondence of Cadwallader Colden with Gronovius, Linnaeus, Collinson and other Naturalists," Am. Jour. Sci. and Arts 44: 133. 1843.

cies by their leaves. No description in words alone can give so clear an idea as when the description is assisted with a picture. She has the impression of 300 plants in the manner you'l see by the sample sent you. That you may have some conception of her manner of describing (of plants) I propose to enclose some (two or three) Samples in her own writing, some of which I think are new genus's. One is of the *Panax folys ternis ternatis* in the Flora Virg. . . . I never had seen the fruit of it till she discover'd it. The fruit is ripe in the beginning of June and the plant dies immediately after the fruit is ripe & no longer to be seen. Two more I have not found described any where and in the others you will find some things particular which I think are not taken notice of by any Author I have seen. If you think S[r] that She can be of any use to you She will be extremely pleased in being employed by you either in sending Descriptions for any Seeds you shall desire or dried specimens of any particular plants that you shall mention to me. She has time to apply herself to gratify your curiosity more than I ever had and now when I have time the infirmities of age disable me."

Mr. Britten describes the "pretty large volume in writing" as follows:

"The 'pretty large volume in writing' is now in the Department of Botany in the British Museum. After the writer's death it passed into the hands of F. von Wangenheim, then into those of Godfrey Baldinger, and finally became the property of Banks. An account of the MS. is prefixed by Wangenheim, and a title-page was added by Baldinger, of which the following is a transcript:

FLORA
NOV.–EBORACENSIS.

Plantas in Solo Natali
collegit, descripsit,
delineavit,
COLDENIA,
CADWALLADER COLDENS
Filia.

Divitiis Bibliothecae
Josephi Banks
adiecit

Ern. Godofr. Baldinger,
olim in Aca. Jememsi Prof. Bot.
et Med. Theoret. ; in Acad. Goettingensi
Med. Pract. ; in Academia Marburgensi
Ord. Medicor. Prof. Primarius.

Anno 1801

"The prefatory note by Wangenheim is published in the account of the MS. given in Schrader's *Journal für die Botanik* for 1800 (Göttingen, 1801) p. 468. The following is a translation :

'This MS., which has never been printed, contains a part of the New York Flora, and has been composed by a lady, the daughter of Governor Cadwallader Colden, well known for his botanical works, and also a physician. This lady married a doctor of medicine, Farquer (Farquhar), a Scotchman by birth, and she died soon afterwards. Some of the names are according to her father and according to Gronovius, and some are according to the Brandenburg doctor Schoepff, who has read this work. The trivial names are according to Linnaeus.

'This work is a remarkable one because it is that of a lady who possessed such a love for botany that she learned Latin, and judging by its nature is so worthy and correct that it contains many even minute things.

'This is written by F. von Wangenheim,
Captain in the Field-Jäger Corps of the Landgrave of Hesse
New York, May, 1782.'

"It will be observed that this narrative contradicts Gray's statement that Jane Colden died unmarried : Pritzel accepts Schrader's account but adds, 'Moriens (1754) Floram manuscriptam Novi Eboraci tabulis ornatam reliquit Wangenheimio.' If the MS. was bequeathed to Wangenheim, it is strange that he did not say so : the date given for her death is certainly inaccurate. Wangenheim's statement that she 'learned Latin' is contrary to her father's account, but probably only means that she acquired the Latin names of the plants she described ; the descriptions in the MS. (to which she gave no title) are all in English.

"The actual number of figures is 340 : the numbers of the descriptions run to 341, but these are really less numerous, as a good many pages are blank, save for the name of the plant at their head. This suggests that the figures were made before the

descriptions ; they are very poor and consist only of leaves.* The descriptions, on the other hand, are excellent — full, careful, and evidently taken from the living specimens. One of these has been published in full (No. 153 of the MS.) in *Essays and Observations*, vol. ii. (Edinburgh, 1770). The plant (*Hypericum virginicum*) to which it refers had been sent her by Alexander Garden, who found it at New York in 1754; in return, Miss Colden sent him the description of the same plant, which she had discovered during the previous summer, and, 'using the privilege of a first discoverer, she was pleased to call this new plant *Gardenia*, in compliment to Dr. Garden.' Another of her descriptions, translated into Latin, was sent by Ellis to Linnaeus in 1758, and is published in the *Correspondence of Linnaeus* i. 94. The plant to which it referred was retained by Linnaeus in *Helleborus*, but separated by Salisbury (who has been followed by subsequent botanists) under the name of *Coptis*. Miss Colden (No. 292) called it *Fibraurea*, a translation of the popular name 'Gold Thread.' Ellis, forwarding the description, says : 'This young lady merits your esteem, and does honour to your System. She has drawn and described 400 plants in your method only : she uses English terms. Her father has a plant called after him *Coldenia*, suppose you should call this *Coldenella*, or any other name that might distinguish her among your Genera.' Unfortunately, Linnaeus did not recognize the genus as distinct, so neither of these names was adopted."

"Little indications in the descriptions show that Miss Colden went among the country folk and noted their names and rustic remedies. Thus of *Pedicularis tuberosa* (No. 41) she says : 'The Pedicularis is called by the country people Betony : They make Thee of the Leaves, and use it for the Fever and Ague.' *Asclepias tuberosa* is 'an excellent cure for the Colick. This was learn'd from a Canada Indian, and is called in New England Canada Root. The Excellency of this Root for the Colick is confirm'd by Dr. Pater of New England, and Dr. Brooks of

*The figures are merely ink outlines washed in with neutral ink, not the 'nature printed' ones mentioned in Colden's letter, of which, however, there is one example at the end of the book.

Maryland likewise confirmed this.' The root of *Solidago canadensis* 'is used in Carolina for the cure of the Negro Poison'; *Oenothera biennis* is 'call'd here by the Country People, Seabedge'; *Malva caroliniana* is 'called in South Carolina, Bohea Tea:' and *Gillenia trifoliata* is 'call'd here, Ipecacuanha.' Occasionally a note shows particular observations, such as this on *Clematis virginiana*: 'Neither Linnaeus take notice (*sic*) that there are some Plants of the Clematis that bear only Male flowers, but this I have observed with such care, that there can be no doubt of it.'"

Numerous references to her in Darlington's * Memorials of John Bartram and Humphry Marshall, Smith's † Correspondence of Linnaeus and elsewhere in contemporaneous records and biographies, evince the fact that she had become well known to her father's friends and that her botanical accomplishments were appreciated and her services in the matter of the collection of seeds and plants often taken advantage of.

Peter Kalm on the 29th September, 1748, sends his respects to Mistress Colden, the Misses and young Master Colden.

In a letter from John Bartram ‡ to Peter Collinson dated 1753, he describes a journey to the "Katskill Mountains" with his son "Billy" and writes of a visit to Coldengham in the following words:

"At night, we lodged seven or eight of us (they being two families) in the hut, hardly big enough for a hen-roost — I and Billy on the ground — after a piece of a musty supper. Slept but little in this lousy hut, which we left, as soon as we could well see our path, in the morning, having paid him half a crown, which he charged, and reached Dr. Colden's by noon. Got our dinner, and set out to gather seeds, and did not get back till two hours within night; then looked over some of the Doctor's daughter's botanical, curious observations. Next morning, as soon as I could see, we hunted plants till breakfast: then the Doctor's son went with me to Doctor Jones's, where we observed the Pines, on a high hill near the Doctor's. After dinner, we went to the river to gather *Arbor Vitae* seeds: then returned to Dr. Colden's by two hours within night. In the morning gathered seeds till break-

---

* Darlington, W. Memorials of John Bartram and Humphry Marshall. Philadelphia. 1849.

† Smith, E. Selection of the Correspondence of Linnaeus. London. 1821.

‡ Darlington. Memorials, 195.

fast. These two days I could have refreshed myself finely, if the Doctor had been at home, or durst have eaten freely of what was set before me: for they all were very kind."

Further on in a letter from Peter Collinson to John Bartram dated January, 1756, he expresses himself in regard to Miss Colden's accomplishments in the following terms:

"Our friend Colden's* daughter has, in a scientific manner sent over several sheets of plants, very curiously anatomized after his † method. I believe she is the first lady that has attempted anything of this nature. They are to be sent to Dr. Gronovius; and he, poor man! I believe is in a bad state of health; for I cannot get a line from him (who used to be very punctual), if he has received Billy's fine drawings of Oaks, and thy system. Though I have writ several letters, I shall this day send another."

But the most interesting of all is the letter from John Bartram to Miss Jane Colden dated January 24th, 1757, that begins:

JOHN BARTRAM TO MISS JANE COLDEN.‡

"January the 24th, 1757.

"RESPECTED FRIEND JANE COLDEN:

"I received thine of October 26th, 1756, and read it several times with agreeable satisfaction: indeed, I am very careful of it, and it keeps company with the choicest correspondence, — European letters.

"The Viney plant thee so well describes, I take to be the *Dioscorea* of Hill and Gronovius; though I never searched the characters of the flower so curiously as I find thee hath done; but pray search them books, thee may presently find that article.

"I shall be extremely glad to see thee once at my house, and to show thee my garden. My Billy is gone from me to learn to be a merchant, in Philadelphia, and I hope a choice good place, too (Captain Childs). I showed him thy letter, and he was so well pleased with it, that he presently made a packet of very fine drawings for thee, far beyond Catesby's, took them to town, and told me he would send them very soon. I was then in a poor state of health: but am now well recovered. We very gratefully receive thy kind remembrance, and my two dear friends, thy father and mother. I want once more to climb the Katskills; but I think it is not safe to venture these troublesome times.

"I have had several kinds of the *Cochleata*, or Snail Trefoil, and *Trigonella*, or Fenugreek; but, being annual plants, they are gone off. The species of Persicary thee mentions, is what Tournefort brought from the three churches, at the foot of Mount Ararat.

"The *Amorpha* is a beautiful flower; but whether won't your cold winters kill it?

---

* Darlington. Memorials, 202.

† Linnaeus.

‡ Darlington. Memorials, 400.

"If the Rhubarb from London be the Siberian, I have it. I had the Perennial Flax, from Livonia. It growed four feet high, and I don't know but fifty stalks to the root; but the flax was very rotten and coarse. The flowers are large and blue. It lived many years and then died.

JOHN BARTRAM.

In a letter written to Dr. Colden,* Dr. Alexander Garden of Charleston, S. C., writes in 1754 "I shall be glad to hear of Miss Colden's improvements, which no doubt increase every day, and may we again be surprised with more than a *Dacier*, even in America."

Dr. Garden's letters, both published and unpublished, contain many allusions to Jane and there were evidently frequent communications that passed between them. In 1755 in a letter to Mr. Ellis † he writes of Dr. Colden as a great botanist and adds with true eighteenth century gallantry that "his lovely daughter is greatly master of the Linnean method." This last statement in regard to her personal appearance, if she at all resembled her distinguished, but homely father, being more due to the adulatory style of the day than to actual fact, and that Jane's good sense resented an excess of flattery is shown in some later letters.

In an undated and unlabeled fragment addressed presumably to Dr. Colden ‡ he writes:

"I have sent you some of the Amorpha a very Curious plant & peculiar to Carolina — in Linnaeus Species Plantar. there is only one Species known but I have (another) which I have brought down from Saluda with me — Miss Colden will be much pleased with it. It flowers with us in Aprile, May & June, & its flowers make a beautiful apearance in a spike. When you favor me with a line please direct to Dr. Alex[d]. Garden, Physician in Charlestown, So. Carolina."

Again in a letter dated Charlestown Febry 18, 1755, he writes:

"I sent you some more of the true Indigo seed and some Millet Seed which I am persuaded will both grow very well to you. I mentioned to Miss Colden that the Small Bags of Shells something like Hops that she has are the real Matrices of the Buccinum ampullatum of Dr. Lister — Give me leave to present my Compliments to Miss Colden and your kind family."

---

* Gray. Selections.

† Smith. Correspondence of Linnaeus, 348.

‡ Colden MSS.

On May 20th, 1755, he writes:

"It gives me great pleasure that you give me leave to send Miss Colden's Description of that new plant to any of my Correspondents as I had before sent it to Dr. Whytt at Edinburgh — By your second letter I find I have very innocently offended Both you and Miss Colden by some of the expressions that insensibly dropt from my pen as archetypes of what my heart dictated in warm sincerety. This gives me real concern and give me leave to assure you I shall endeavour as far as in my power to amend anything in my conduct or manner of writing that you are kind enough to point out as wrong. I trust that Both you and your Daughter will forgive me for once. I shall be more sparing in saying what .y. think is due to such merit in the future. The Expression which you say gave her most offence, gives me now a great deal of uneasiness as I suspect it has deprived me of the pleasure of a letter from her by last opportunity — It is now past the season of Seeds but I'll endeavour to procure Such as Miss Colden may want this year, tho' my present Business confines me much to Town. — Please offer my compliments to Miss Colden & Family."

Another letter and one of the last containing references to Miss Colden is the following:

Charlestown, November 27, 1755.

"Sir — Your most obliging fav^{r} of Octo^{re} last now lyes before me, which came very safe to hand by Schermerhorn as Did the Papers of seeds which your daughter was kind enough to honour me so by his formal trip. I readily confess my neglect in not writing her in return sooner but an affair of Love quite engrossed my thoughts for a season * — [and he ends a long somewhat fantastic letter with —] offer of a kindest compliment to Miss Colden," etc.

Miss Colden's accomplishments were not all, however, of a botanical nature. Her mother, Mrs. Colden, the daughter of a Scotch minister, is said to have been a distinguished woman and fully able to fill the social position and to discharge the many duties that fell to her lot. In addition to the numerous cares that were imposed on the housewife of the period, Mrs. Colden assisted her husband in the administration of his estate and in the copying of his correspondence, and owing to his political duties and consequent lengthy and frequent absence from home, much of the education of their children must have devolved on her. She is said to have taught them habits of "virtue and

* The "affair of love" is doubtless an allusion to his approaching marriage, which occurred in Charleston on Christmas Eve, 1755.

economy" and gave them in her life and character the "brightest of examples," so it can be presumed that her daughters were apt scholars in the accomplishments required of well-bred and trained gentlewomen of the day.

The following reference to Miss Colden was the means of identifying with a fair amount of certainty some unsigned household records of hers that are preserved among her father's scientific papers. *

Walter Rutherfurd was an ancestor of the well-known New York family of that name. He came to America in 1756, while the French war was in progress, and served as an officer of the Royal Americans. In New York in 1758 he married Catharine, the widow of Elisha Parker and a daughter of James Alexander. About this time he wrote to a friend in Scotland, describing a visit to Albany: †

"At one of our landings we made an excursion to Coldenham, the abode of the venerable Philosopher Colden, as gay and facetious in his conversation as serious and solid in his writings. From the middle of the Woods this family corresponds with all the learned Societies in Europe. Himself on the principles of Matter and Motion, his son on Electricity and Experiments. He has made several useful discoveries and is a tolerable proficient in music. His daughter Jennie is a Florist and Botanist, she has discovered a great number of Plants never before described and has given their Properties and Virtues, many of which are found useful in Medicine, and she draws and colors them with great beauty. Dr. Whyte, of Edinburg, is in the number of her correspondents. N. B. She makes the best cheese I ever ate in America."

With this note in mind it does not seem unreasonable to suppose that the "Memorandum of Cheese made in 1756" is in Jane's writing. This "Memorandum" consists of five sheets of foolscap and is the careful and painstaking record of her year of cheesemaking. The following are the two first receipts:

---

* Colden MSS.

†Family Records and Events, Compiled chiefly from the original MSS. in the Rutherfurd Collection. By Livingston Rutherfurd. Privately printed; 1894. (Only 150 copies.)

MEMORANDUM OF CHEESE MADE IN 1756.

May

25 No 1. To this I had a large Pan of Milk more than the Cheese tray would hold. I had used Rennet that was left since last summer, it was very long of thickening & I was obliged to put a great deal in. I made it according to a receipt I got from Sister Willet.* In scalding the Curd after it was chopped there was a good deal of yellow oyl raised on top of the Whey, as it was on the Curd & and when I drained it the second time it had lost much in Bulk. I can not approve of this method, it lost a good deal of rich whey. I expect it will be strong of the Rennet and not be good. (It was good except a little too much taste of the Rennet)

27 2. To this I had the same quantity of milk as to the former, I put one Spoonfilles of the Rennet in it, it thickened in a very short time. I made it after my Mother's old manner, it was a tender good curd and lost very little rich Whey. When it came out of the press it weighed 25 pounds. The first weighed 20 pounds, the third day after it came out of the press.

Later, in the following November she weighed her cheeses and notes their reduced bulk, and there are also notes as to how they eventually tasted. At the end of the sheets she made a list of her milkings and the sales of her butter, showing that in the year she sold 348 pounds of butter that netted her £12.13.3. She even did not omit the names of the purchasers of her butter, nor the amounts sold each time.

It is impossible not to conjecture as to whether any of these cheeses were those extolled by Walter Rutherfurd! And it is much to be regretted that the drawings "coloured with great beauty" have all disappeared. They surely cannot have been the figures done in "ink outlines washed in with neutral ink" of the "pretty large volume" so graphically described by Mr. Britten.

Jane Colden † married Dr. William Farquhar, a Scotchman and a widower; their marriage license was dated March 12th, 1759. She died March 10th, 1766; her only child in the same year

* Alice, third daughter of Governor Colden, born September 27, 1725, married Colonel William Willet, she being his second wife. She died in 1762.

† Purple, Colden Family in America, 20.

and her husband in 1787. He is described as "a very worthy good Scotsman" and for some years before the Revolutionary War one of the chief and fashionable practitioners of medicine, "distinguished for his abilities and knowledge" in New York City and vicinity. He was one of the founders of the St. Andrew's Society of the State of New York, formed in 1756 of Scotchmen by birth or descent for social and charitable purposes. He acted as an "assistant" (manager) of the Society in 1756 and as vice-president in 1757. *

After 1759 Jane's name does not appear to be mentioned in her father's correspondence, nor can any reference to her marriage be found there. Her place of burial is unknown.

Governor Colden died on Long Island, September 20, 1776, aged over eighty-eight years, and was buried in the private burying-ground on the Willett farm, "Spring Hill," that he purchased in 1762 and where he spent the last years of his life. This property had been deeded by the governor before his death to his son David, but owing to the latter's loyalty to the Crown it was confiscated in 1779 and passed into other hands. At the present time, Governor Colden's farm lies within the limits of Cedar Grove Cemetery in the Borough of Queens, and the ancient burying-place is still extant. Though fallen into decay, it has not been disturbed and is to be preserved in its present condition. Numerous rough stones, bearing the names of members of the Willett family are dated from 1722 to 1797, and local authorities relate that there is a stone with a Colden name on it there, but owing to the heavy snowdrifts at the time of writing, this could not be verified, and does not agree with descriptions of the spot made in 1873.† Governor Colden's fine old mansion is now the office of the cemetery, and is said to have been but little altered in recent years.

---

* For some of these details, I am indebted to Mr. George Austin Morrison Jr., Secretary of the Saint Andrew's Society.

† Purple, Genealogical Notes, 9.

NEW NORTH AMERICAN CRATAEGI

By W. W. Eggleston

Crataegus Oakesiana sp. nov.

Sometimes a small tree 5 meters high but more often a beautiful round-topped shrub with the habit of *C. rotundifolia* (Ehrh.) Borckh.: the bark grayish-brown and scaly; the young twigs slightly pubescent at first, becoming smooth, chestnut-brown, and frequently armed with bright chestnut-brown, stout, curved spines from 2 to 4 cm. long: leaves ovate, 3–7 cm. long, 2–6 cm. wide, doubly serrate for the upper two thirds, finely serrate towards the base, acute or acuminate at apex, cuneate at base, often abruptly so, green and shining above, paler beneath, slightly pubescent on the upper surface when young, soon becoming smooth; petioles wing-margined above, remotely glandular-serrate, 1–2 cm. long: flowers about 2 cm. wide in many-flowered, slightly villous, compound corymbs; calyx-tube villous, the lanceolate, acuminate, glandular-serrate sepals smooth on the outside, slightly pubescent on the inside; stamens about twenty; anthers light-yellow; styles 3–5: fruit ripening the first week in September, pyriform to oblong, slightly angular, yellowish-red, about 1 cm. thick, with deciduous sepals; the flesh soft, mealy, light-yellow, containing 3–5 nutlets, 6–7 mm. long, strongly ridged on back, the nest of nutlets 7–8 mm. thick.

This species occurs frequently along the roadsides and in open thickets by the Connecticut River in Essex County, Vermont, at an altitude of about 300 meters. Specimens seen: *no. 1146*, Aug. 5, 1899; *no. 3410*, May 31, 1903; *no. 3411*, Sept. 15, 1903; and *no. 1146*, Sept. 9, 1904—all at Bloomfield, *Eggleston*. *No. 2205*, May 26, 29, 1901; *no. 1859*, Oct. 3, 1901—both at Canaan, *A. B. Frizzell*. Type *no. 1146*, *Eggleston*, in the Herbarium of the New York Botanical Garden.

Crataegus Oakesiana belongs to the group Rotundifoliae, differing from *C. rotundifolia* in larger flowers, thinner differently shaped leaves, and pear-shaped yellowish fruit, with more nutlets.

Crataegus Baroussana sp. nov.

A bush sometimes 5–6 m. high, with smooth, reddish-brown twigs armed with slender, curved spines 2–3 cm. long: leaves ovate-elliptical to obovate, coarsely and doubly serrate on the

upper two thirds, often slightly cut towards the apex, finely serrate or entire towards the base, acute or acuminate at the apex, broadly cuneate at the base, 3–7 cm. long, 3–4.5 cm. wide, subcoriaceous, dark-green and shining above, paler below, young leaves slightly appressed-pubescent above, becoming scabrous, smooth beneath; petioles slightly winged above, a little pubescent, about 1 cm. long: flowers white, about 15 mm. wide, in few-flowered, slightly villous, compound corymbs; pedicels subtended by deciduous pinkish bracts about 10 mm. long, 2 mm. wide, the edges serrated with stalked glands; calyx-tube smooth or sometimes slightly pubescent; sepals linear-lanceolate, acuminate, sharply glandular-serrate, about 7 mm. long, smooth on the outside, appressed-pubescent above; stamens about 10; anthers light salmon-pink; styles 4–5, smooth at base: fruit oblong to pyriform, red, slightly pubescent, about 2 cm. long; flesh thick, soft when mature, ripe about the first of October; calyx-lobes reflexed, generally deciduous; fruit containing generally five nutlets 7–8 mm. long, strongly ridged on the back, nest of nutlets about 8 mm. thick.

This species was found by Dr. C. G. Pringle on the estate of Mr. Eugene Barousse in the mountains southeast of Saltillo, Coahuila, Mexico; he states that it is reported from other mountains in the State of Coahuila, and that the fruit is used in a marmalade in a number of towns of the state. Type, *no. 10083, Pringle*, Oct. 4, 1905 (flowers, April 12, 1906), in herbarium of the New York Botanical Garden.

This species is entirely different from any described from either Mexico or South America; it seems to have its nearest relatives among some of the Texas species, being nearest to *C. Berlandieri* Sargent, except in the character of the leaves, in which it has some affinities with the group Douglasianae of the western United States.

New York Botanical Garden.

SHORTER NOTES

New Stations for two Plants. — *Kyllinga pumila.* — Professor R. E. Schuh, of California, Pa., recently sent me some plants which he identified as *Kyllinga pumila* Michx. On comparison with material in the Carnegie Museum the identification

proves correct. The plants were collected along a ditch near California, Washington County, Pa. It has not been formerly reported from this state, and possibly this marks the northeastern limit of this plant.

The range for this plant is given in Gray's Manual, Ohio to Illinois, south to Florida and Texas; in Britton and Brown's Illustrated Flora, Virginia to Florida, west to Illinois, Missouri, Texas and Mexico; in Small's Flora of the Southeastern U. S., Virginia to Illinois, Missouri, Florida, Texas and Mexico.

Cycloporus Greenei. Mr. and Mrs. O. E. Jennings, of the Carnegie Museum, collected some fungi at Ohiopyle, Pa., during the month of September, 1906, and in the collection was an excellent specimen of *Cycloporus Greenei* (Berk.) Murrill. Only one plant was found. This is the first report of its occurrence in Pennsylvania. Dr. Murrill reports it from the following states: Massachusetts, New York, Connecticut, New Jersey, Iowa, West Virginia, Vermont. (Bull. Torrey Club **31**: 423. 1904.)

D. R. Sumstine.

Wilkinsburg, Pa.,
January 2, 1907.

Note upon a Guam Species of Ipomoea. — In Safford's "Useful Plants of Guam," Contr. U. S. Nat. Herb., volume 9, Mr. W. F. Wight proposes a new name, *Ipomoea Choisiana* for *I. denticulata* (Desr.) Choisy (1833), not R. Br. (1810). It would seem strange if one who has written as much regarding the Convolvulaceae as has Choisy, should not already have had some species in the group named for him, and we find several, two of them in *Ipomoea*, viz:

Ipomoea Choisyi Montr. Mem. Acad. Lyon **10**: 237. 1860.
Ipomoea Choisyana Hallier f. Bot. Jahrb. **18**: 130. 1894.

The species which Mr. Wight renames has other names prior to that taken up by Choisy in *Ipomoea*. Robert Brown described it as *I. gracilis* (Prodr. 484. 1810), and as there appears to be no earlier use of that name in *Ipomoea*, it will stand for that species.

Ipomoea gracilis R. Br. Prodr. 484. 1810. G. Don, Gen. Syst. **4**: 271. 1838.

Convolvulus denticulatus Desr.; Lam. Enc. Meth. **3**: 540. 1789.

C. gracilis Spreng. Syst. **1**: 604. 1825.

Ipomoea littoralis Blume,. Bijdr. 713. 1825.

I. denticulata Choisy, Mem. Soc. Phys. Genev. **6**: 467. 1833. DC. Prodr. **9**: 379. 1845. Not R. Br. 1810.

I. Choisiana W. F. Wight, Contr. U. S. Nat. Herb. **9**: 298. 1905.

It is to be noticed that Choisy also admits *I. gracilis* R. Br. in the DeCandolle Prodromus (**9**: 370), without having seen any specimens. Hallier, who has made rather exhaustive studies in this group, pronounces *I. gracilis* of R. Brown identical with *I. denticulata* Choisy but retains the latter name for the species. (Bot. Jahrb. **18**: 139. 1894.)

H. D. House.

Clemsen College, S. C.

A new Polygalaceous Tree of Porto Rico. — **Phlebotaenia Cowellii** spec. nov. A tree about 6 meters high, with a trunk diameter of 1.5 dm., the twigs puberulent. Leaves elliptic to obovate-elliptic, coriaceous, acutish to short-acuminate at the apex, narrowed at the base, 7–11 cm. long, 3–5 cm. wide, glabrous on both sides except for a few short hairs on the upper side of the midvein near the base, the midvein impressed above, prominent beneath, the numerous and nearly straight lateral veins reticulate-anastomosing, more prominent above than beneath, the puberulent petiole 1 cm. long or less: racemes and pedicels tomentulose; racemes nearly or quite sessile on leafless branches, 4–10-flowered; pedicels slender, joined at the base, 6–10 mm. long; larger sepals concave, slightly unequal, about 3 mm. long, ciliolate; corolla purple, 1.5 cm. long; wings oblong-obovate, obtuse, short-clawed; keel 3-lobed, hooded, clawed, the lobes rounded, the middle lobe longer than the basal ones; petals spatulate, unequal; stamen-tube longer than the slender filaments; style slender, curved: fruit not seen.

I have alluded to this tree (Jour. N. Y. Bot. Gard. **7**: 136) as a most elegant floral feature; we had the good fortune to see it in full bloom on a steep rocky bank near Coamo Springs, Porto Rico, March 23, 1906, and good specimens of the flowers and foliage were secured (*Britton & Cowell 1331*).

The discovery of this tree adds a second species to the supposed monotypic genus *Phlebotaenia* Griseb., the type species, *P. cuneata* Griseb., being Cuban and not known to become more than a low shrub. Professor Chodat has reduced Grisebach's genus to a section of *Polygala*, but although the floral characters of *Phlebotaenia* are only slightly different from those of some Polygalas, I am quite unable to agree with him that this shrub and tree are congeneric with herbaceous Polygalas.

Professor Urban had the foliage of the Porto Rican species, collected by Sintenis near Utuado in 1887, but while correctly referring the plant in the distributed collection of Sintenis as probably Polygalaceous, he was unable to describe it, and it is not included in his flora of Porto Rico.

N. L. Britton.

Some new Plants for southern New Jersey. — The flora of southern New Jersey seems to be far from exhausted in spite of the many botanists who have devoted their attention to it. During the past few years members of the Philadelphia Botanical Club and others have found several species that are not quoted in Britton's Manual or in the Illustrated Flora as ranging north of Virginia or Delaware.

It seems desirable to call special attention to these additions to the flora of the state, although two or three of them are already recorded in Kellar and Brown's Flora of Philadelphia.

Paspalum glabratum. Found by the writer at Cape May in September, 1891, and by others at several points in Cape May County.

Brachiaria digitarioides. Collected at Piermont, September 1, 1902, by the writer, and at about the same time at Holly Beach by S. S. Van Pelt. Found abundantly near Cold Spring, Cape May County, September, 1906.

Saccolepis gibba. Discovered by C. S. Williamson at Cape May Point, September, 1905, and observed at the same place a year later by Van Pelt and Stone.

Chaetochloa magna. Collected near Cape May, September, 1891, by W. Stone.

Aristida lanosa. Collected near Medford, N. J., September 15, 1901, by W. Stone.

Sporobolus asper. Found in considerable abundance near the Bay shore above Cape May Point, by W. Stone, September 15, 1906.

Cyperus pseudovegetus. Collected near Swedesboro by Charles D. Lippincott, September 16, 1894.

Eleocharis ochreata. Discovered by S. S. Van Pelt at Cape May Point, September, 1905, and again observed the present year.

Rynchospora oligantha. Found near Speedwell, Burlington County, by S. S. Van Pelt, in July, 1906.

Specimens of all the above are in my own herbarium or in that of the Philadelphia Botanical Club.

Witmer Stone.

Academy of Natural Sciences, Philadelphia.

PROCEEDINGS OF THE CLUB

December 11, 1906

The meeting was called to order at 8:15 P. M., at the American Museum of Natural History, with President Rusby in the chair. Eight persons were present.

The reading and approval of the minutes for November 28 were followed by the nomination of Mr. Richard Schneider, of the New York Botanical Garden, for membership.

A communication, dated December 7, 1906, from the New York Academy of Sciences was read, formally inviting the Torrey Botanical Club "to send a delegate to the regular meeting of the Council on January 7, 1907," and enclosing "the amendments of the Constitution of the New York Academy of Sciences, which concern this matter and which have been drawn up according to the terms of agreement."

The amendments are as follows:

Article IV. First sentence to read: "The officers of the Academy shall be a President, as many Vice-Presidents as there

are Sections of the Academy, a Corresponding Secretary, a Recording Secretary, a Treasurer, a Librarian, an Editor, six *elected* Councillors, *and one additional Councillor for each allied society or association*."

Article VI. A new article to be inserted as "Article VI," to read as follows:

"Societies organized for the study of any branch of science may become allied with the New York Academy of Sciences by consent of the Council. Members of allied societies may become active members of the Academy by paying the Academy's annual fee, but as members of an allied society they shall be associate members of the Academy with the rights and privileges of other associate members except the receipt of its publications. Each allied society shall have the right to delegate one of its members who is also an active member of the Academy, to the Council of the Academy, and such delegate shall have all the rights and privileges of other Councillors."

On motion it was voted unanimously that the President of the Club act as such delegate. The proposed amendment to Article XIV of the Constitution of the Club, which was laid on the table at the last meeting, came up for consideration. After discussion, a motion to adopt the amendment was unanimously carried.

The amendment reads as follows:

"Each active member, upon his election, and annually at the beginning of each fiscal year thereafter, shall pay to the treasurer the sum of five dollars. The payment of the annual dues shall entitle each active member to receive all publications of the Club issued during the year."

Letters of resignation were read from Mrs. Ida Clendenin Atchison, and from Miss Marianna Shutes.

On motion the secretary cast the vote of the Club electing Mr. Schneider to membership.

The scientific program was as follows:

"Some Hawthorns of the Vicinity of New York City," by Mr. W. W. Eggleston. Species and variations of *Crataegus* growing within the vicinity of New York City were described and illustrated by herbarium specimens.

" Centers of Distribution of Coastal Plain Plants," by Roland M. Harper.

One of the most familiar phenomena of plant distribution is that neighboring areas of equal extent often differ considerably in the number of species they contain. And it usually happens that a region with a rich flora (if a large enough area be taken into consideration) contains a considerable number of endemic species, also that many species which are not endemic grow more abundantly or vigorously in such places than in other parts of their ranges.

A well-known example of a center of distribution is the southern Appalachian region, which has the greatest variety of trees to be found anywhere in temperate eastern North America, most of which grow larger there than anywhere else ; and many species are now confined to that region, though some of them were doubtless more widely distributed in prehistoric times. Isolated islands and mountain peaks in all parts of the world are also noted for their endemic species.

Our Atlantic coastal plain (shown on map which was exhibited), though in some respects a unit, contains several pretty well defined centers of distribution. Beginning at the northern end, the first center to be considered is the so-called " pine-barrens " of New Jersey. From the available literature it would seem that the following species are either confined to that region or else are much commoner in New Jersey than in adjoining states :

Schizaea pusilla, *Sporobolus compressus*, *Dichromena colorata*, *Rynchospora pallida*, *R. Knieskernii*, *R. Torreyana*, *Xyris fimbriata*, *X. flexuosa* (*torta* of most authors), *Eriocaulon Parkeri*, *Juncus caesariensis*, *Abama americana*, *Helonias bullata*, *Xerophyllum asphodeloides*, *Oceanoros leimanthoides*, *Tofieldia racemosa*, *Uvularia sessilifolia nitida*, *Aletris aurea*, *Lophiola aurea*, *Gyrotheca tinctoria*, *Pogonia divaricata*, *Arenaria caroliniana*, *Drosera filiformis*, *Corema Conradii*, *Ilex glabra*, *Hypericum adpressum*, *Rhexia aristosa*, *Dendrium buxifolium*, *Pyxidanthera barbulata*, *Gentiana Porphyrio*, *Sclerolepis uniflora*, *Chrysopsis falcata*, *Coreopsis rosea*.

Most of these are monocotyledons, and there are more species of Melanthaceae in the list than of any other family.

The next well-marked coastal plain center seems to be in the southern corner of North Carolina. The following species are rarely, if ever, seen more than 100 miles from Wilmington :

Tofieldia glabra, Hypoxis micrantha, Dionaea muscipula, Kalmia cuneata, Coreopsis falcata, Leptopoda Curtisii.

The following species of wider distribution seem to be more abundant within about 50 miles of Wilmington than they are at a distance of 100 to 200 miles in either direction :

Selaginella acanthonota, Pinus palustris, P. serotina, Aristida stricta, Campulosus aromaticus, Dichromena latifolia, Zygadenus glaberrimus, Lilium Catesbaei, Smilax laurifolia, Habenaria blephariglottis, Nymphaea sagittifolia, Amorpha herbacea, Polygala lutea, P. ramosa, Gordonia Lasianthus, Cyrilla racemiflora, Clethra alnifolia, Vaccinium crassifolium, Sabbatia lanceolata, Carphephorus bellidifolius, Aster squarrosus, Marshallia graminifolia.

By far the greatest center of pine-barren plants, or perhaps an aggregation of two or more subcenters, is in Georgia and northern Florida. Probably $\frac{3}{4}$ if not $\frac{9}{10}$ of all pine-barren species can be found in Georgia ; at least a dozen are confined to that state and many more to Georgia and Florida together. In the Altamaha Grit region (the middle third of the coastal plain) of Georgia there are nearly 150 species on sand-hills, about the same in dry pine-barrens, 200 in moist pine-barrens, and 75 in pine-barren ponds. These numbers are undoubtedly larger than for the same habitats in any other state unless it be Florida.

In subtropical Florida there are of course many plants not found farther north, but practically all of these center in the tropics and therefore outside of the region under consideration.

Going westward from Florida we find in the vicinity of Mobile and Pensacola a center comparable with that in southern North Carolina. To this belong *Myrica inodora, Sarracenia Drummondii, Drosera filiformis Tracyi, Pitcheria galactioides*, and perhaps *Carphephorus Pseudo-Liatris. Chamaecyparis thyoides* and *Sarracenia purpurea*, which are as common within 50 miles of Mobile Bay as they are in New England, seem to be entirely wanting at twice that distance, and do not appear again within two or three hundred miles, as far as known.

Pine-barrens extend as far west as Texas, and there ought to be some species of pine-barren plants confined to Louisiana and Texas, but too little is known of the flora of those parts as yet.

Plants of muddy swamps seem from all accounts to be most numerous in the Mississippi embayment of the coastal plain, from about the mouth of the Ohio River southward. Characteristic species of this region, most of them woody plants, are:

Taxodium distichum, *Echinodorus radicans*, *Arundinaria macrosperma*, *Hymenocallis occidentalis*, *Leitneria floridana*, *Hicoria Pecan*, *H. aquatica*, *Quercus Michauxii*, *Q. lyrata*, *Planera aquatica*, *Celtis occidentalis*, *Brunnichia cirrhosa*, *Platanus occidentalis*, *Crataegus viridis*, *C. apiifolia*, *Amorpha fruticosa*, *Ilex decidua*, *Acer saccharinum* (*dasycarpum*), *Berchemia scandens*, *Nyssa uniflora*, *Bumelia lycioides*, *Adelia acuminata*, *Trachelospermum difforme*, *Asclepias perennis*, *Gonolobus laevis*, *Vincetoxicum gonocarpos*, *Bignonia crucigera*, *Tecoma radicans*, *Conoclinium coelestinum*, *Mikania scandens*, *Eupatorium serotinum*.

Most of these are not wholly confined to the coastal plain, but they are more common there than elsewhere, and few if any of them ever ascend more than 1,000 feet above sea-level. Going eastward in the coastal plain they become perceptibly scarcer. There are fewer of them in Georgia than in Alabama, still fewer in the Carolinas, and only about half of them reach Virginia, though there is nothing in the climate to hinder them, as far as known.

In contrast to these five or six evident centers a few of the regions with poorer flora may be mentioned.

The coastal plain of Delaware, Maryland and Virginia seems to lack many of the species common to New Jersey and the southern pine-barrens, though some of them will probably be reported when those parts are better explored. South Carolina, too, seems to be a rather uninteresting state floristically, and there are perhaps no good species confined to it. The upper fourth of the coastal plain of Georgia (*i. e.*, the part outside of the pine-barrens) has quite a diversified topography and vegetation, but practically all the plants growing there range either northward to the mountains or coastward to the pine-barrens.

A part of the Cretaceous and Eocene regions of the coastal plain from western Alabama through northern Mississippi and West Tennessee to Kentucky is remarkable for the paucity of its flora. It is entirely outside of the pine-barrens, and nearly all of its species seem to be common and widely distributed. The same remarks will probably apply to the coastal plain of Arkansas.

The ultimate reason why so many species are found in some parts of the coastal plain and so few in others is still obscure, and perhaps each center will require a different explanation. But the importance of locating these centers is obvious ; for any one who wishes merely to collect as many species as possible will save time by confining his operations to the vicinity of known centers, and the possibilities of discovering new species are greater there than in the poorer regions. When the species belonging to each center are more accurately listed, it may then be possible to discover their significance.

Adjournment was at ten o'clock.

C. Stuart Gager,
Secretary.

December 26, 1906

The regular afternoon meeting of December 26 was omitted, and in the evening a reception was given in Schermerhorn Hall, Columbia University, to visiting botanists in attendance upon the meeting of the American Association for the Advancement of Science.

Six hundred and thirty-one invitations were issued. Notes of regret were received from 169 and acceptances from 95. These notes are preserved in the files of the secretary. About one hundred and twenty-five persons were in attendance, including local members. Refreshments were served by Mazetti, of 103 West 49th St.

The evening passed quickly and pleasantly, and the reception was a most enjoyable affair to all present.

The committee of arrangements, appointed at the meeting of the Club on October 31, consisted of Professor L. M. Underwood (Chairman), President H. H. Rusby, Mrs. E. G. Britton, Dr. H. M. Richards, and Dr. C. Stuart Gager. The expenses were borne

by voluntary contributions from members of the Club. Details are included in the report of the committee.

C. Stuart Gager,
Secretary.

January 8, 1907

The annual meeting was called to order at 8:30 P. M., with Vice-president Burgess in the chair. Eight members were present.

In the absence of the recording secretary, Dr. Barnhart was elected secretary *pro tem.*

The minutes of the meeting of December 11, 1906, were read and approved.

Resignations of two members, Miss Rosina Rennert, of 366 West 120th St., and Mrs. Robert T. Morris, of 152 West 57th St., were presented and accepted.

The annual report of the treasurer was read and on motion was received and referred to the auditing committee.

In accordance with a recommendation accompanying the report of the treasurer, it was voted that a committee be appointed to report at a subsequent meeting upon the status of the membership of the Club. The treasurer and the editor were constituted a committee for this purpose.

The editor presented a verbal report. The *Bulletin* and Torreya have appeared as usual during the year, and the usual amounts have been expended upon them. Of the *Memoirs*, Vol. 13, and Vol. 12, No. 2, have been issued, upon such terms that the actual expense to the Club has been an inconsiderable one. The report was accepted.

There were no reports from the secretaries and none from the field committee.

Dr. Britton reported verbally for the standing committee on the local flora, urging the desirability of systematic work with a view to the publication of the results, and emphasizing the need of some competent person willing to undertake the direction of such work.

The annual election resulted as follows: president, H. H. Rusby; vice-presidents, E. S. Burgess and L. M. Underwood; corresponding secretary, J. K. Small; recording secretary, C.

S. Gager; treasurer, C. C. Curtis: editor, J. H. Barnhart; associate editors, Philip Dowell, A. W. Evans, T. E. Hazen, M. A. Howe, W. A. Murrill, H. M. Richards, A. M. Vail.

A proposed constitutional amendment was submitted by Dr. Barnhart, as follows:

"Originally, the Torrey Botanical Club had a single editor. In the revised constitution, adopted January 11, 1882, an assoate editor was added to the list of officers. By an amendment adopted December 14, 1886, the constitution was altered to read 'associate editors, not to exceed five in number,' and by a further amendment (adopted January 26, 1898) the word five was changed to 'seven.' The constitution in its present form, therefore, reads: 'associate editors, not to exceed seven in number.'"

The proposition hereby submitted is, that Section III of the constitution be amended by the substitution of the word "eight" for the word "seven," so as to read, "associate editors, not to exceed eight in number."

Upon motion, the meeting then adjourned.

John Hendley Barnhart,
Secretary pro tem.

NEWS ITEMS

The University of Michigan has come into the possession of a tract of land of about thirty acres, which, it is expected, will be developed as a botanical garden.

Members of the Torrey Botanical Club will be pleased to learn of the promotion of their fellow-member, Dr. Alexander W. Evans, to the Eaton professorship of botany in the Sheffield Scientific School of Yale University.

Miss Clara Eaton Cummings, Hunnewell professor of cryptogamic botany in Wellesley College, died in Concord, N. H., on December 28. Miss Cummings was well known to the botanical world through her systematic studies of the lichens.

We learn from *Science* that Professor William Trelease, director of the Missouri Botanical Garden, left St. Louis on January 24 for an expedition to the West Indies, which is expected to last about two months.

William Titus Horne (B.S., Nebraska, 1898), who held the fellowship in botany in Columbia University in 1903–'04, has been advanced to the headship of the department of plant pathology in the Estación Central Agronómica de Cuba — the position recently held by Dr. Melville T. Cook.

Dr. and Mrs. N. L. Britton and Dr. and Mrs. C. F. Millspaugh left New York early in February to continue the botanical exploration of the Bahamas. They plan this time to visit the outer islands of the group, including Eleuthera, Little San Salvador, Cat, Conception, Watlings and Long islands, and are expected to return to New York late in March.

An expedition from the University of Chicago, represented by Professor Otis W. Caldwell, and accompanied by Professor C. F. Baker and Mr. H. A. van Hermann, of the Estación Central Agronómica de Cuba, has been exploring the tree-cycad region in the Sierras of western Cuba. Cycads of regal proportions, 15 to 30 feet in height, with cones weighing 25 pounds, were found. Large series of specimens in many groups and numerous photographs were taken.

The twelfth annual winter meeting of the Vermont Botanical Club and the sixth of the Vermont Bird Club were held at the Fairbanks Museum, St. Johnsbury, January 18 and 19. Among the botanical papers presented were "Variations in Plants" by President Ezra Brainerd, "Further Observations on the Potato-Leaf Fungi" by Professor L. R. Jones, "About Red Clover" by Professor H. M. Seely, "Local Floras of Vermont" by Dr. John H. Barnhart, and "The Flora of the Limestone Cliffs of Pownal" by W. W. Eggleston. Miss Mabel Strong reported the finding of *Dryopteris Filix-mas* in Woodstock, the second known Vermont station for this fern. Officers of the Club for the ensuing year are: president, President Ezra Brainerd; vice-president, Dr. Cyrus G. Pringle; secretary and treasurer, Professor L. R. Jones; executive committee, Professor L. R. Jones, Dr. H. H. Swift, and Mrs. T. C. Fletcher. The next summer's field meeting will be held July 2 and 3 in Pownal, the extreme southwestern township of Vermont.

OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 33, published in 1906, contained 635 pages of text and 26 full-page plates. Price $3.00 per annum. For Europe, 14 shillings. Dulau & Co., 37 Soho Square, London, are agents for England.

Of former volumes, only 24–33 can be supplied entire; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Vols. 24–27 are furnished at the published price of two dollars each; Vols. 28–33, three dollars each.

Single copies (30 cts.) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–11 and 13 are now completed and Nos. 1 and 2 of Vol. 12 have been issued. The subscription price is fixed at $3.00 per volume in advance. The numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **The Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

THE TORREY BOTANICAL CLUB
Columbia University
NEW YORK CITY

Vol. 7 March, 1907 No. 3

TORREYA

A Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE AND PHILIP DOWELL

JOHN TORREY, 1796–1873

CONTENTS

Published for the Club
At 41 North Queen Street, Lancaster, Pa.
by The New Era Printing Company

[Entered at the Post Office at Lancaster, Pa., as second-class matter.]

THE TORREY BOTANICAL CLUB

TORREYA is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, fifteen cents. To subscribers elsewhere, five shillings, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to TREASURER, TORREY BOTANICAL CLUB, 41 North Queen St., Lancaster, Pa., or Columbia University, New York City.

Matter for publication should be addressed to

MARSHALL A. HOWE
New York Botanical Garden
Bronx Park, New York City

Vol. 7 No. 3

TORREYA

March, 1907

ON SOME DISTRIBUTION FACTORS IN THE SIERRA MAESTRA, CUBA

By Norman Taylor

Botanical collecting in the tropics constantly reminds one of the difficulty of forming any real idea of the factors that govern the distribution of plants.

In a survey of the mountains west of Santiago, Cuba, many plants of very curious distribution were met with. To travel for four weeks over a somewhat restricted but heterogeneous country and find only a single individual of *Amyris elemifera*, and also single specimens of *Calophyllum Calaba*, of a certain *Oncidium*, and of an unnamed *Euphorbia*, makes one wonder what are the factors that govern such sporadic occurrences. And these are not the only species that have apparently only individual representation, for here and there throughout the various habitats visited we came across trees, shrubs and even some herbaceous plants that were never seen again. This remarkable feature of tropical forests has often been noted before,* but no reasonable explanation is forthcoming.

Besides this occurrence of lone individuals, we find also what might be called "species centers."† That is, some species would be found in a very restricted area, and then either not be seen again, or else found in some distant but ecologically related habitat. Only a very few plants were observed in this state, which after all may be more a matter of coincidence or accidental dispersion than any well-defined system of distribution. The most noticeable of the species having these apparent distri-

* Warming, E. On the Vegetation of Tropical America. Bot. Gaz. 27: 2. 1899.

† Kurz, S. Report on the Vegetation of the Andaman Islands, 16. 1870.

[No. 2, Vol. 7, of Torreya, comprising pages 21–48, was issued February 28, 1907.]

bution centers is *Peperomia maculosa*. It was first seen growing under the shade of *Pinus occidentalis*, on a mountain slope that except for this *Peperomia* might be considered edaphically xerophytic. Not until our descent from the ridge of the Maestra did we find it again, when a fair representation was seen in an almost identical situation and at approximately the same altitude. Its absence on a number of such mountains that we visited, and its occurrence on these particular two, would seem to conform to no well-known law of distribution.

The method employed by the forestry expert in getting an idea of the timber value of an area is perhaps the best possible way to gather data on the tree distribution. From a study of these notes and figures,* we came to know the frequency of occurrence and characteristic habitat of the commercially more important trees. But the number of exceptions, and the lawlessness of the occurrence of the monotypic species, together with the equally inexplicable "species centers" make it dangerous to draw any conclusions. Indeed it is practically impossible to form any law that can reasonably account for the distribution of even a small number of the species in this region.

Although it is very difficult, perhaps impracticable, to get any real idea of the distribution of the species, it is quite possible to get some notion of the factors that govern the occurrence of the various plant associations. From topographic and climatic conditions that have been elsewhere more fully described,† we have in these mountains two well-defined ecological areas: the country lying on the southern slope, which is mostly dry, and the country on the northern slope and ridge. The latter is the windward side of the range and the strong Northeast Trade deposits most of its moisture here, leaving very little for the leeward and drier southern exposure. This has, of course, an obvious effect on the vegetation, and by this is meant not so much the diversity in the species, although this is great, as the marked difference existing in the general vegetative or floristic character of these contrasted situations.

* Fernow, B. E. The High Maestra. Forestry Quarterly 4: 250. 1906.

† Fernow, B. E. *Loc. cit.* 239; Taylor, N. Collecting in the Mountains west of Santiago, Cuba. Jour. N. Y. Bot. Garden 7: 256. N 1906.

Taking first the region within the lee of the Maestra, we have two main factors that must be taken into account in any attempt to understand the regional distribution of the plant groups; and these are the practical stability of the temperature and rainfall, and the great instability and inequality of available surface- or drainage-water. With these in mind we may enumerate several variations in the plant associations that are directly traceable to one or both of these factors. Other factors, such as soil, which throughout the region is a decomposition of the native granite, and light, which does not vary enough to make much difference, may for the time be ignored. There seems little doubt that both of these agencies are equally potent in all situations, and are not therefore violent causes of variation. On this southern exposure the three following characteristic areas may be enumerated:

Slopes and Ridges

These are covered with a dense growth of trees. The actual number of species is not very great but the number of individuals is enormous. In the expedition some hundred and fifty species were noted, and, allowing for others that were overlooked, this vast tract is covered almost exclusively with this arboreal vegetation. The number of individuals of the lower shrubs and herbaceous plants is not accurately determinable, but it is very small, so small that it can be almost truly said that these slopes and ridges are without undergrowth. An appended list of the collections from one such slope will give some idea of these conditions:

Litobrochia denticulata
Oplismenus hirtellus
Arthrostylidium capillifolium
Pharus latifolius
Tillandsia fasciculata
Renealmia occidentalis
Vanilla phaeantha
Cecropia sp.
Pisonia aculeata
Oxandra virgata
Pithecolobium arboreum
Lysiloma Sabicu
Lonchocarpus sericeus
Bursera Simaruba
Swietenia Mahagoni
Cedrela odorata
Drypetes lateriflora
Spondias lutea
Carpodiptera cubensis
Calyptranthes sp.

The list is necessarily incomplete, but it will serve to show the preponderance of tree species. The greatest number of individuals is found in *Calyptranthes* and *Oxandra*, with certainly other arboreal species coming very close to them. The lack of undergrowth is very marked, and throughout the forest one finds an unbroken succession of ridges and slopes carpeted with little but a covering of dried leaves. The grasses *Arthrostylidium capillifolium*, *Oplismenus hirtellus* and *Pharus latifolius* are the most common herbaceous species, and these with *Renealmia occidentalis* are about the only ones that are frequent enough to be noticed.

The lack of undergrowth is due almost solely to the want of available surface- or drainage-water. There is practically no humus, for the reason that the conditions that will produce it are wanting. We have therefore a dry, almost arid, but well-wooded formation that is devoid of under-vegetation.

Cañons

The gorges are as profusely covered as the adjoining forest-floor is bare and naked. A list prepared from the collections in a typical cañon will give some idea of the species likely to occur in such places:

Helicophyllum sp.	*Oncidium* sp.
Campyloneurum angustifolium	*Peperomia rotundifolia*
" *Phyllitidis*	" *acuminata*
" *latum*	" *scandens*
Ceropteris calomelaena	*Peperomia obtusifolia*
Asplenium pumilum	*Boehmeria littoralis*
Doryopteris pedata	*Pilea nudicaulis*
Dryopteris sp.	" *microphylla*
Polypodium Plumula	" sp.
" *polypodioides*	*Rajania hastata*
Anthurium sp.	*Drymaria* sp.
Philodendron lacerum	*Picramnia pentandra*
Renealmia occidentalis	*Pavonia Typhalaea*
Epidendrum cochleatum	*Marcgravia* sp.
Pleurothallis Wilsoni	*Gilibertia arborea*

Wallenia laurifolia	*Psychotria* sp.
Asclepias nivea	*Chiococca parvifolia*
Solanum triste	*Diapedium assurgens*
Hamelia lutea	*Lobelia* sp.
Psychotria lasiophthalma	*Adenostemma Berterii*

But no mere list can give one the least idea of the vegetal wealth and beauty of one of these gorges, and they are all the more striking in contrast with the arid slopes through which they have cut their way. With vines festooned among the trees and shrubs and almost all the trees covered with epiphytes the scene is most beautiful.

These gorges are a fine example of the action of an edaphic factor as a determinant in the plant-covering of a restricted area. The climatic and primary soil conditions are practically identical in the cañons and the slopes. But the water that is at the bottom of all these gorges is almost the sole factor in producing such profusion on the one hand, and the lack of water is certainly the chief cause of such scarcity on the other. The moisture and consequent decomposition of successive generations of herbaceous plants make a rich, damp compost, and we therefore find here a profusion of plants in striking contrast to the poverty of the ridges and slopes.

River Bottoms and Deltas

The sterility of most of the river bottoms, particularly where they spread out to form the delta, is a very marked feature of this region.* With the exception of species of *Plumiera* and a few other tree species, these areas are without arboreal vegetation. A rather rank growth of somewhat xerophytic shrubs and weeds gives the whole river bottom a characteristic appearance not unlike a typical "scrub" of the Bahamas. The line of demarcation between these sterile areas and the well-wooded hills that rise abruptly on both sides is very sharp ; and it is quite as much the sudden change as the sterility that will strike the collector. This sterility is caused by the floods that annually wash

*Taylor, N. Botanical Notes on the Vegetation of the High Maestra. Forestry Quarterly 4 : 270. 1906.

out the available soil, so that little is left to support a heavier vegetation.

Practically the whole southern slope may be roughly divided into these three areas, the first, of course, being much the largest. And all these are in a great measure controlled by the presence or absence of available surface water. It is, in short, to this edaphic factor that we must turn for an explanation of the barrenness of the slopes, the profusion of the cañons, and the sterility of the river bottoms. With soil, light, and climatic conditions so even throughout this great southern exposure, there is only this instability and inequality of terrestrial water sources that can account for the marked diversities existing among these three types.

It is unnecessary to discuss the strand and littoral, as they are much the same throughout the West Indies and have little to do with the problem of the general or regional distribution of the plants of this area.

Turning now to the windward or northern slope and the ridge of the Maestra, we have entirely different conditions prevailing. Here the northeastern trade-wind keeps the country continually bathed in great quantities of moisture, and the precipitation is heavy. From this constant equality of moisture supply and an almost similar equality of temperature this ridge is an ideal environment for moisture-loving plants of all kinds.

The vegetation forcibly reminds one of the lowland cañons, but it is much more dense; so much more so that without cutting a path it is impossible to scramble through. Many plants occur here that we had never seen at the lower elevations, but the number of species is so great and the time spent here so short, that any list based on the present collections would give no adequate idea of the richness and variety of the flora. Filmy-ferns, tree-ferns, epiphytic orchids and bromeliads, hepatics and mosses, together with many Peperomias, seem to predominate, but the whole effect is one of bewildering complexity and density. The vegetation is evenly distributed at all the points that we visited on the ridge and windward slope, but the line of demarcation in this belt is clearly seen when one begins the descent to the sea, thus leaving the region that comes under the influence of the trade-wind.

It would seem, then, from the foregoing, that in the distribution of the plant groups in this great mountain range, we have not, primarily, a problem of altitude. For the altitude *per se* can scarcely be of much importance as a determinant, for by it no greatly changed conditions of atmospheric pressure are reached, our greatest elevation being nowhere more than three thousand six hundred feet. It is cooler, however, at the ridge than at the coast and this may have some effect on the precipitation, and, secondarily, of course, on the plants.

But the Maestra rises more or less abruptly from the level part of Cuba, and furnishes a great barrier of from three to eight thousand feet in height and about sixty miles long. Its altitude thus at once becomes the all-important factor in regulating the amount of rainfall that gets over to the leeward side of the range. This action of the ridge in monopolizing the better part of the moisture from the trade-wind is responsible for the comparative dryness of the whole southern exposure. The division of the area into regions coming under the influence of this wind and those lacking it, is, therefore, not such an arbitrary proceeding as one might suppose who had not seen this marked example of the importance of the rainfall in determining the general characteristics of any given area. In the variation of the plant associations cited under the discussion of the southern slope other factors must be taken into consideration. But these are almost wholly local in their effect and are not therefore comparable to a factor of the scope and importance of this trade-wind.

New York Botanical Garden.

A NEW BLACKBERRY FROM THE VICINITY OF PHILADELPHIA AND WASHINGTON

By William H. Blanchard

The blackberries in the vicinity of Philadelphia and Washington were studied by the writer in July, 1906. The species found are not numerous. *Rubus hispidus* L. and *R. cuneifolius* Pursh occur, but are not common generally, though *R. cuneifolius* is

abundant on the sandy plains of southern New Jersey; *R. alleghaniensis* Porter (*R. nigrobaccus* Bailey), the common blackberry of New England, is rare; but there are three which are common. Perhaps the most abundant of all is the common dewberry *R. procumbens* Muhl. The southern high blackberry, *R. Andrewsianus* Blanchard, which is common from southern Connecticut and northern New Jersey to North Carolina, is abundant and a prolific bearer. The third in abundance is an undescribed species of the *frondosus* class which seems to have been unnoticed by botanists. Though it often makes a very large plant, it is seldom as tall as *R. Andrewsianus* and in general appearance is a sort of "half high" or intermediate between *R. procumbens* and *R. Andrewsianus*. It may be named and described as

Rubus philadelphicus sp. nov.

Large, round-stemmed, erect-recurving plants, pubescent and glandless, lightly armed, fruit-branches leafy, bearing a fine crop of large, early, much esteemed fruit.

New canes. — Stems stout, hard, erect at first, then recurved, 2 to 4 feet high, 4 to 8 feet long, greenish, glabrous and glandless, terete or nearly so, much branched, the branches recurved and the end touching the ground, or prostrate, few noticed tipping. Prickles few, 4 or 5 to the inch of stem, 0.125 to 0.184 inches long, slender, strong, set at a right angle to the stem and in lines over the pentagonal pith. Leaves 5-foliolate, large ones 9 inches long by inches wide, rather thick, yellow-green, with many appressed hairs, but nearly smooth on the upper surface, slightly whiter, with much pubescence, and velvety below. Leaflets broad, often only the middle ones noticeably stalked, taper-pointed, singly or slightly doubly serrate-dentate, otherwise entire; middle leaflet broadly ovate, rounded at the base or slightly cordate, the side leaflets broadly oval or rhomboidal, wide-cuneate, and the basal ones similar in shape but smaller. Petiole and petiolules stout, grooved, villose-pubescent, glandless; prickles rather numerous, stout and hooked; the petiole of the middle leaflet less than 1 inch long, the side leaflets short-stalked and the basal ones sessile.

Old canes. — Stems hard, prickles intact. Second year's growth consisting entirely of leafy fruit-branches, from 6 to 12 inches long, tipped with inflorescence, the branches graded regularly in length, one from the axil of each old leaf. Axis of branch some-

what zigzag, angled, stout, villose-pubescent, glandless; prickles not numerous, small, stout, and hooked. Leaves trifoliolate, the upper unifoliolate, thickish, of moderate size or small, coarsely dentate, very velvety on the lower surface and nearly smooth above; leaflets broad; unifoliolate leaves very broad and often slightly incised or deeply 2-incised. Inflorescence on a short axis, cymose or cymose-corymbose; pedicels very pubescent, with rarely a few stalked glands, 4 to 8 set at a small angle or erect, and an erect one from the axil of each lower leaf, those composing the cyme subtended by broad unifololiate leaves or some without subtending leaves. Flowers not seen. Fruit ripening before the middle of July, nearly globose, about 0.5 inch in diameter. Very productive, flavor fine. Ripe two weeks earlier than *R. Andrewsianus.*

This is a very abundant plant in the neighborhood of Philadelphia and Lancaster, Pennsylvania, and quite as abundant around Washington, D. C.

This species is closely related to *R. frondosus* Bigelow and needs careful study. It is evidently wide-spread. There was no specimen of it in the National Herbarium at Washington. There was, however, one specimen at the Academy of Sciences of Philadelphia, collected recently by Dr. Ida A. Keller.

WESTMINSTER, VERMONT.

MELANOSPORA PARASITICA

BY GUY WEST WILSON

This interesting species was collected in fair abundance in the vicinity of Van Cortlandt Park, New York City, the present season on *Isaria farinosa* (Dicks.) Fries, the conidial stage of *Cordyceps militaris* (L.) Sacc. Saccardo's Sylloge Fungorum contains the descriptions of two species of ascomycetous fungi which occur upon this host. A comparison of the descriptions led to the discovery that the characters given are insufficient to warrant the separation of these species. The first mention of this fungus is by L. Tulasne who described it as *Sphaeronema parasitica* * on *Isaria crassa* from France. A few years later the brothers

* Ann. Sci. Nat. IV. 8: 40, note 2. 1857.

Tulasne transferred the species to the genus *Melanospora* and published a complete series of figures.* The next record of the occurrence of this fungus is by Plowright † who records it upon *Isaria farinosa* in England. He redescribes and refigures the species. Aside from the arrangement of the spores in the ascus the two accounts are essentially the same. Saccardo ‡ questions the correctness of this disposition of species and suggests that it probably belongs to *Ceratostoma* on account of its light-colored perithecium.

The first mention of the species from America is by Ellis and Everhart § who described it as *Ceratostoma biparasiticum* from material sent from Ohio by C. G. Lloyd. The material collected this season agrees with the description and the type specimen of the American species and equally well with the description of the European. The only points of difference are such as would be expected from two observers working on two continents independently of each other. The European species is described as having hyphae about 3.5 μ in diameter, spores 5–6 $\mu \times$ 2.5 μ and perithecia about 200 μ in diameter with a beak about 40–50 $\mu \times$ 1000–2000 μ while the American species has hyphae about 3 μ, spores 6–7 $\mu \times$ 1.5 μ and perithecia 80–100 μ with a beak 30–40 $\mu \times$ 1000 μ. The brothers Tulasne had abundant material from which to describe their species as they not only collected it in its native haunts but cultivated it in the laboratory, while the type in the Ellis herbarium consists of a single plant of *Isaria* parasitized only at the base and containing at most a small number of perithecia. In a series of some half dozen or more infested plants of *Isaria* it is not difficult to find all regions of the host parasitized and perithecia with a considerable range in size. The American material is somewhat smaller than the European but otherwise the same. The perithecia are usually intermediate in diameter between the measurements given in the two descriptions and range from 1000 to 1500 μ in height.

* Sel. Carp. Fung. **3**: 10. *pl. 3. f. 11–14.* 1865.
† Grevillea **10**: 71. *pl. 158. f. 3.* 1881.
‡ Syll. Fung. **2**: 464. 1883.
§ Bull. Torrey Club **24**: 127. 1897.

The problem of specific identity is by no means so complicated as that of generic relationship. That our fungus is not a *Sphaeronema* is evident from its production of ascospores, but its place in the one or the other of the two remaining genera to which it has been referred is not so easily decided, as they are very similar even though they belong to supposedly very different orders. In each case the perithecium is flask-shaped with a very long beak, rather light in color although appearing quite black to the naked eye. In *Melanospora* the perithecia are isolated, with a cottony stroma, which is sometimes wanting or poorly developed, and have the ostiolum surrounded by a fringe of hairs. In *Ceratostoma* the perithecia are also isolated, the stroma and fringed ostiolum are absent and paraphyses are usually present. The spores and asci are similar in both genera. In hope of assistance from a comparison of the material at hand with the types of the genera in question their history was traced. The genus *Ceratostoma* was founded by Fries on *Ceratospermum* Mich., which had *C. nigrum* Mich. (= *Ceratostoma podioides* Fries) as the type[*]. This species has hyaline spores and is now known as *Valsa ceratophora* Tul. It is therefore evident that if our species is a member of the genus *Ceratostoma* as at present accepted it does not belong to the Friesian genus of that name. A further search shows that unless the species now assigned to that genus belong to *Ceratostomella* Sacc., from which they are distinguished only in spore-color the genus is without a name. The genus *Melanospora* was founded by Corda [*] with *M. Zamiae* as its type. With this species the one in question is undoubtedly congeneric. The synonymy of the species is as follows:

MELANOSPORA PARASITICA L. Tul. & C. Tul. Sel. Fung. Carpol. **3**: 10. 1865.

Sphaeronema parasitica L. Tul. Ann. Sci. Nat. IV. **8**: 40, note 2. 1857.

Ceratostoma biparasiticum Ellis & Everh. Bull. Torrey Club **24**: 127. 1897.

* Obs. Myc. **2**: 337. 1818.

† Icones. Fung. **1**: 24 *pl.* 7. *f.* 297 *A.* 1837.

SHORTER NOTES

The scientific Name of our common Huckleberry. — In 1787, Wangenheim (Beitr. Am. 30. *pl. 39. f. 69*) published a description of a plant named by him *Andromeda baccata*. The figure of the plant is a fair one, and from it and the description there is no doubt that the plant so named is the common American huckleberry. Two years later, Aiton (Hort. Kew. 2 : 12) published the name *Vaccinium resinosum* for the same plant, and when in 1843 the plant was referred to *Gaylussacia* by Torrey & Gray (Torr. Fl. N. Y. 1 : 449) the combination *Gaylussacia resinosa* was made. Since that time the plant has appeared in American botanies as *Gaylussacia resinosa* (Ait.) T. & G., but the above synonymy and the correct name of our plant were noticed many years ago by K. Koch (Dendrol. 2^1 : 93. 1872), and it would seem to be proper for American botanists now to adopt the name published by him for this common and well-known plant, namely *Gaylussacia baccata* (Wang.) K. Koch.

In like manner, the form published by Professor Robinson as *Gaylussacia resinosa glaucocarpa* (Rhodora 2 : 83) should become **Gaylussacia baccata glaucocarpa.**

Kenneth K. Mackenzie

East Orange, New Jersey.

A new Lentinus from Pennsylvania.—**Lentinus pulcherrimus** sp. nov. Pileus entire, coriaceous, umbilicate, indistinctly marked with concentric zones, covered with fascicles of yellowish tan-colored hairs, the fascicles arranged in radiating rows, giving the pileus a corrugated appearance ; margin inflexed, 2 cm. broad, covered with lanate hairs ; flesh white, scarcely 1 mm. thick ; gills white, narrow, subdistant, rounded behind, free, margin entire ; stem central, concolorous with the pileus, tomentose, equal, solid, white within, 3 cm. long, 1.5 mm. thick ; spores white, broadly ovate ; odor fetid, especially in drying, finally disappearing, somewhat like the odor of *Claudopus nidulans*.

Growing on buried sticks, Kittanning, Pa. July, 1904.

Type specimens are in the Carnegie Museum, Pittsburgh, Pa.

In general appearance the plants resemble specimens of *Coltricia cinnamomea* (Jacq.) Murrill, and might be mistaken for that

species. It is also closely allied to the following tropical species, *L. villosus*, *L. siparius*, *L. sparsibarbis*, *L. pyramidatus*. The following table will aid in distinguishing the different species :

	Pileus with two kinds of hairs, lanate and rigid.	1.
	Pileus not as above.	2.
1.	Pileus yellowish tan-colored, slightly umbilicate.	*L. pulcherrimus*.
1.	Pileus orange, deeply umbilicate.	*L. siparius* B. & C.
2.	Hairs of pileus in pyramidal fascicles.	*L. pyramidatus* B. & C.
2.	Hairs of pileus fascicled toward center, scattered and depressed.	*L. sparsibarbis* B. & C.
2.	Hairs of pileus not fascicled.	*L. villous* Klotsch

David R. Sumstine.

Wilkinsburg, Pa.

A new Species of Evolvulus from Colombia. — The following new species was detected among the specimens of *Evolvulus* in the National Herbarium at the time the three Mexican species described by the writer * were studied :

Evolvulus sericatus sp. nov.

§ Alsinoidei. Stems herbaceous from a perennial root, erect, 3–5 dm. tall, slender, usually branching above; stem silky-hirsute with appressed hairs ; leaf-blades sessile or the petioles less than 1 mm. long, narrowly oblong-lanceolate, usually broadest near the middle, 1–2 cm. long, about one-third as wide, rounded or obtuse at the base, the apex obtuse and submucronate, densely and finely appressed silky-villous above, more densely so beneath, both the lower and the upper leaves somewhat reduced ; peduncles exceeding the subtending leaves, 1.5–2.5 cm. long, 3–9-flowered, bracts subulate, long-tipped, about 2 mm. long; pedicels 6–8 mm. long; sepals ovate-lanceolate, acuminate, 3–3.5 mm. long, densely silky-pubescent with sub-appressed hairs, the tips erect in fruit; corolla nearly rotate, 6–7 mm. broad, entire, blue with white plicae, the plicae hirsute without ; capsules globose, 2-valved, 4-seeded ; seeds glabrous, dark-brown, minutely roughened.

Colombia : Papagayeras, 800 m. alt., *E. Langlasse, no. 12*, November 4, 1899. Type in the herbarium of the United States National Museum.

Related to *E. villosus* Ruiz & Pav., from which it differs by its

* Bull. Torrey Club 33 : 315–317. 1906.

appressed silky pubescence and few-flowered peduncles. So many species of *Evolvulus* of northern South America extend into Central America and the West Indies that it is possible the species here described may be found in Panama or Central America.

Homer D. House.

Clemson College, South Carolina.

REVIEWS

Scott on the Present Position of Palaeozoic Botany*

Band 1, Heft 1, of Progressus Rei Botanicae published by the International Association of Botanists under the editorial supervision of Dr. J. P. Lotsy promises to be of very considerable value, if one may judge from the initial instalment. Leaving it to others to characterize the merits of Strasburger's and of Flahault's contributions, I wish to direct attention to the very valuable summary by Scott of "The Present Position of Palaeozoic Botany."

Paleobotany has been to such a large extent divorced from botany in the past and so largely ignored by botanists that I am sure that this summary will be read with surprise by a goodly number who have heretofore looked upon paleobotany with somewhat of disdain as a science engaged in the more or less questionable occupation of describing fragments of prehistoric plants whose identification is more or less uncertain. Granting that identifications are oftentimes not all that might be desired, and it may be remarked parenthetically that this shortcoming is not the exclusive possession of those who deal with fossil plants, nevertheless the fact remains that the number of fossil plants in some orders, as for instance the Cycadales, far exceeds their living representatives; other orders are wholly unknown in the modern flora (Sphenophyllales, Cordiatales); while in still other groups the modern representatives are but mere remnants of once large and complex assemblages whose existence would not have been

*Scott, D. H. The Present Position of Palaeozoic Botany. Progressus Rei Botanicae 1 : 139–217. 1907.

dreamt of were it not for the study of fossil remains. I refer to the Equisetales and Lycopodiales. While not holding a brief for the study of paleobotany, the prediction is eminently true that in a few years' time it will be as much of an absurdity to pretend to discuss the broader questions of morphology, systematic botany, or geographical distribution without taking paleobotany into account as it is now for a zoölogist to discuss the morphology, classification, or geographical distribution of mammals without an intimate acquaintance with Tertiary vertebrate paleontology.

The limits and relative development of the various classes in the Paleozoic were so different from what we are familiar with in modern floras and the time involved was so enormous, that it is difficult properly to orient oneself; we forget that Paleozoic time was longer than all time since its close, and that it undoubtedly afforded opportunity for the evolution of structures and habits far beyond what we have been accustomed to imagine.

In the study of Paleozoic floras, discovery has trod upon the heels of discovery during the past few years so that the present summary of a scattered and special literature is not only timely, but coming as it does from the pen of one who is such a master workman in the ranks of investigators in this field, it possesses an added value and authority. After a brief introduction the various groups are taken up in a systematic order, commencing with the algae and ending with the Gymnospermae, the treatment being mainly morphological and evolutionary. Space forbids an extended notice. The work itself is succinctly condensed and should be on the work-table of every botanist. A few points may be merely enumerated.

The probable abundance of Carboniferous fungi and the total absence of authentic Bryophyta is noted, the latter fact somewhat puzzling to those who assign so great a theoretical importance to this sub-kingdom. Interest centers in the vascular plants and it is pointed out that their division into Pteridophyta and Spermatophyta ceases to be a natural one with the discovery of the Pteridospermatophyta. Thus these terms are likely to follow the Cryptogamia and Phanerogamia into the limbo of disuse before many years. Seed-like organs in two very different genera of

Paleozoic lycopods (*Lepidocarpon*, *Miadesmia*) would seem to indicate that a variety of quasispermatophytic Lycopodiales await future discovery. Considerable space is devoted to the Filicales and stress is laid upon the new viewpoint resulting from the recent discoveries which have so greatly restricted the Filicales, their position in the Carboniferous flora becoming subordinate instead of dominant. True ferns of the family Botryopterideae are, however, described in detail. It may be remarked that the present state of opinion is preëminently transitional and unsatisfactory and, as it seems to me, is destined to considerable future modification. The Pteridospermatophyta or fern-like seed plants are described in considerable detail and will more than repay a careful perusal. The Gymnospermae are treated with great briefness since there is little of novelty to record.

With these few hints at the rich gleanings which await the student, this very brief and inadequate notice is brought to a close.

Edward W. Berry.

Maryland Geological Survey.

PROCEEDINGS OF THE CLUB

January 30, 1907

The second regular meeting for the year 1907 was called to order at the museum building of the New York Botanical Garden at 3:30 P. M., with Vice-president Underwood in the chair. Twenty-three persons were present.

A brief account of the reception given by the Club on December 26, 1906, and the minutes of the annual meeting, January 8, 1907, were read and approved by the Club.

The name of Miss Ruth Price, 19 East 48th Street, was presented for membership.

Under "unfinished business," the annual reports of the recording and the corresponding secretaries for 1906 were presented and accepted.

Resignations were received and accepted from the following persons: Mr. F. H. Blodgett, Baltimore, Md.; Mr. Charles L.

Case, 56 Wall St., New York City; Sarah B. Hadley, South Canterbury, Conn.; Mrs. Katherine Winthrop Kean, 25 East 37th St., New York City.

The following amendment to the Constitution, proposed by Dr. J. H. Barnhart at the preceding meeting of the Club, came up for discussion and was unanimously adopted:

"That Article III of the Constitution be amended by the substitution of the word 'eight' for the word 'seven,' so as to read, 'associate editors, not to exceed eight in number.'"

The attention of the Club having been called to the fact that Dr. H. H. Rusby, elected at the meeting of December 11, 1906, to represent the Club in the Council of the New York Academy of Sciences, was already a member of the Council, Vice-president L. M. Underwood was elected as the Club's representative on the Council.

The secretary presented the matter of the Club's record of its membership and on motion the secretary was empowered to prepare a card catalogue of the members with pertinent data, to be kept in the custody of the secretary.

On motion, the secretary cast the ballot of the Club electing Miss Ruth Price to membership.

Dr. C. B. Robinson was nominated as associate editor, and on motion the secretary cast the ballot of the Club electing Dr. Robinson.

Dr. Marshall A. Howe, who had returned on that day from the island of Jamaica, gave an account of his experiences there during the disastrous earthquake of January 14, 1907.

The announced scientific program was as follows:

"New or Rare Mosses from Jamaica," by Mrs. N. L. Britton.

Mrs. Britton exhibited some of the most interesting mosses collected in Jamaica, showing several genera and subgenera not heretofore known in the West Indies, and several new species, and also indicated reductions of some names to synonymy. There were also shown specimens of types of Jamaican species from the Mitten Herbarium and one of Miss Taylor's drawings of a new species and subgenus.

"The Probable Function of Tannin in Galls," by Dr. Melville T. Cook.

The origin, chemistry, and uses of tannin have been studied very extensively, but other phases of the subject have received comparatively little attention. This is especially true concerning the functions which it serves in the plant. It is usually very abundant in diseased tissues, such as insect galls, fungus galls, fungus spots, etc. In insect galls it is developed very early and in some cases it appears to result in the gall-makers moving to other parts of the plant. It is also formed in fungus galls, frequently surrounding the point of rupture. In such fungus spots as those produced by *Cercospora* the successive circles are due to the depositing of the tannin within the tissues. The speaker has made extensive studies on the anatomy of both insect and fungus galls and is now conducting a series of physiological experiments.

C. Stuart Gager,
Secretary.

Feburary 12, 1907

The Club was called to order at the American Museum of Natural History, with President Rusby in the chair. Ten persons were present.

The reading and approval of the minutes of the meeting of January 30, 1907, was followed by the presentation of the name of Mrs. J. S. Ehrich, 1 West 72d St., New York City, for membership.

The president appointed the following committees for the current year:

Finance. — Judge Brown and Professor Richards.

Admissions. — Professor Burgess, Dr. Small, Dr. Curtis.

Local Flora. — (Phanerogams), Dr. Britton, Mr. Bicknell, Miss Mulford, Mr. Eggleston, Mr. Schneider; (Cryptogams), Professor Underwood, Dr. Howe, Dr. Murrill, Mrs. Britton, Mr. Williams.

Program. — Dr. Howe, Professor Underwood, Mrs. Britton.

Field Meetings. — Mr. Wilson, Mr. Nash, Mr. Vreeland.

Referring to the subject of the work of the committee on the local flora, the need of more active work was urged. To this end, a motion was made and seconded that the committee be empowered to appoint additional members to facilitate additional

study of the local flora and the enlargement of the herbarium of the Club. The motion was unanimously carried.

The secretary cast the ballot of the Club electing Mrs. J. S. Ehrich to membership.

The following scientific program was presented:

"Source of Nutrition of Submerged Aquatics," by Dr. Raymond H. Pond. Dr. Pond gave an interesting account of his investigation of this problem, in which it was ascertained that submerged aquatic plants, when rooted in the soil, obtain nutriment from the latter, and so, in time, become contributors to the food content of the supernatant water. The advantage which thus results to the associated plankton, and consequently to the local fish fauna, was pointed out. These investigations also demonstrated the possession, by rooted aquatic plants, of abundant root-hairs, contrary to the previous general supposition. These results have been published in the U. S. Fish Commission Report for 1903, pp. 483 to 526.

An interesting discussion followed.

"Some Wound Reactions of Plants," by Professor H. M. Richards. A popular exposition was given of the physiological effects of the wounding of plants.

The Club adjourned at 10 P. M.

C. STUART GAGER,
Secretary.

NEWS ITEMS

Dr. K. M. Wiegand, of the department of botany of Cornell University, has been appointed associate professor of botany in Wellesley College.

The death of J. Schneck, M.D., of Mt. Carmel, Illinois, is reported. Dr. Schneck wrote a "Catalogue of the Flora of the Wabash Valley," and contributed several shorter botanical papers to various journals.

Dr. John A. Shafer, museum custodian of the New York Botanical Garden, returned on March 2 from a collecting expedition to the island of Montserrat of the British West Indies.

Five weeks were spent on this island and a few days on the island of Antigua.

Muhlenbergia, with No. 1 of Volume 3, January, 1907, becomes a monthly journal. It has hitherto been chiefly a medium for the publication of the researches of its editor, A. A. Heller, of Los Gatos, California, but will now be open to contributions from the general botanical public. The subscription price is one dollar a year.

Dr. Auguste-François-Marie Glaziou, for many years director of the Public Gardens of Rio Janeiro, died at Le Bouscat, near Bordeaux, in the latter part of 1906, aged 73 years. He was an indefatigable and most successful collector of Brazilian plants during his thirty-five years' residence in that country. His collections have been studied and described chiefly by others, but he wrote a "Liste des Plantes du Brésil Central recueillies in 1861–1895," which was in the course of publication in the *Mémoires de la Société Botanique de France* at the time of his death.

Beginning with Volume 10 (1907) *The Plant World* will be published under the direction of an association of twelve botanists, consisting of Professor J. C. Arthur, Miss M. M. Brackett, Dr. N. L. Britton, Dr. W. A. Cannon, Professor W. F. Ganong, Professor D. S. Johnson, Dr. B. E. Livingston, Professor F. E. Lloyd, Dr. D. T. MacDougal (chairman), Dr. W. B. McCallum, Professor V. M. Spalding, and Professor J. J. Thornber. Official relations with the Wild Flower Preservation Society of America will be discontinued, but the scope of the journal will be enlarged by including more notes and news of botanical interest, accounts of explorations, illustrations of experiments, discussions of evolution and plant-breeding, etc. The subscription price is still one dollar a year and Professor Francis E. Lloyd, of the Desert Botanical Laboratory, Tucson, Arizona, remains managing editor.

OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 33, published in 1906, contained 635 pages of text and 26 full-page plates. Price $3.00 per annum. For Europe, 14 shillings. Dulau & Co., 37 Soho Square, London, are agents for England.

Of former volumes, only 24–33 can be supplied entire; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Vols. 24–27 are furnished at the published price of two dollars each; Vols. 28–33, three dollars each.

Single copies (30 cts.) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–11 and 13 are now completed and Nos. 1 and 2 of Vol. 12 have been issued. The subscription price is fixed at $3.00 per volume in advance. The numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **The Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

THE TORREY BOTANICAL CLUB
Columbia University
NEW YORK CITY

Vol. 7 April, 1907 No. 4

TORREYA

A Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE AND PHILIP DOWELL

JOHN TORREY, 1796–1873

CONTENTS

Published for the Club
At 41 North Queen Street, Lancaster, Pa.
by The New Era Printing Company

[Entered at the Post Office at Lancaster, Pa., as second-class matter.]

TORREYA is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, fifteen cents. To subscribers elsewhere, five shillings, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to TREASURER, TORREY BOTANICAL CLUB, 41 North Queen St., Lancaster, Pa., or Columbia University, New York City.

Matter for publication should be addressed to

MARSHALL A. HOWE
New York Botanical Garden
Bronx Park, New York City

Vol. 7 No. 4

TORREYA

April, 1907

LOCALIZATION OF PLANTS IN THE FINGER LAKE REGION AND THE ADJACENT ONTARIO LOWLANDS OF CENTRAL NEW YORK*

By W. W. Rowlee

Central New York consists in general of two physiographic districts, the western plateau to the southward and the Lake Ontario lowlands to the northward. The former is an elevated country traversed by valleys most often but not always trending north and south, the latter an undulating plain. The prevailing soil is clay in the hills, and sandy or gravelly loam in the lowlands. The lakes of the two regions also differ in their general character. Those of the hill region are long and narrow and deep and enclosed by abrupt hills; those of the lowlands are shallow, often contain islands and shallow bars, and have low shores. The lake system of this region has often been designated the Finger Lake region, with Oneida Lake as the "thumb." Oneida and Onondaga lakes of the lowlands, however, differ from those of the uplands, not only in elevation, mode of formation, and shore characters, but also in the flora they support. They are, in reality, pools left behind when the Greater Lake Ontario subsided to its present limits. Their shores are not abrupt, nor do they rise to any considerable elevation. Oneida Lake has several islands that are wooded, the most noted being Frenchman's Island, toward its western end. It has also what the fishermen call "Blind Islands," islands that appear above the surface when the water is low but are submerged at high water. The lake, moreover, is full of stony and sandy bars,

* Contribution no. 121 from the Botanical Department of Cornell University.

[No. 3, Vol. 7, of Torreya, comprising pages 49-68, was issued March 19, 1907.]

differing from the blind islands only because of their distance below the surface of the water. These bars are the favorite fishing grounds in the lake. The resemblance of the Blind Islands to the summits of the hills in the lowlands which bore the same relation to the former Greater Lake Ontario, shows at once that the old lake must have been full of blind islands. Islands of the same character exist near the outlet of Lake Ontario and on the north shore but none on the south shore.

One of the striking features of plant distribution is the common fact that some species of plants are widely and continuously disseminated, while others occur only in remote and limited localities. The latter are often designated rare species. In some cases species are rare in one region and abundant in another, so it may not be undesirable to use the expression in our title to designate the well-known condition where plants are confined to small areas. Plants of this description fall into three groups:

1. Plants of recent introduction.
2. Plants requiring peculiar conditions.
3. Plants with no apparent cause for limited range.

Plants of Recent Introduction. — Plants are localized upon their introduction into new regions. The rapidity with which they spread depends largely upon the capacity of the plant to spread by seed dissemination or otherwise.

Three species introduced into the region under discussion illustrate this very well.

Hyoscyamus has been known to occur on the fort grounds in Oswego for many years. It has not gotten beyond their limits yet.

Erythrea Centaurium was introduced at Oswego, how long ago, no one knows; some have surmised as early as the French domination of Canada. In 1880 it had spread into every neighborhood within a radius of ten miles, and it may now be found even twenty miles from the city. Beyond these limits it is not known in central New York.

In 1888 a few limited localities for *Hieracium aurantiacum* were known in Oswego Co. It seems to have been there as early as in any place in the state. Now it is everywhere, and is beyond doubt one of the most pernicious and persistent weeds in the state.

Of these three, the last plant to be introduced has attained by far the widest distribution, just because it possessed qualities enabling it to thrive and spread.

Plants Requiring Peculiar (usually Edaphic) Conditions. — There are several localities in this region where soil conditions are peculiar, and in these places, species, often groups of species, appear that do not occur elsewhere. Peat-bogs, localities about salt springs, marl-formations, and sand-dunes, all have species peculiar to them, and all are represented in the region. Many of the species found in these places are identical with species found along the Atlantic coast, and this led Paine, in his Catalogue of the Plants of Oneida County, page 133, to conclude that "their presence here is proof, first, that the sea originally came up to and covered the place; and, second, that these plants were flourishing at that time." That plant migration may account for the occurrence of these plants inland, is highly probable. Nevertheless, the number of species involved and the isolation of the areas from the ocean and from each other would seem to lead naturally to Paine's conclusion. Peat-bogs have been the subject of many recent investigations. In the American Naturalist, the writer has discussed the distribution of the peat-bog flora in the Lake Ontario lowlands and pointed out the occurrence in them of a considerable element representing plants of the Atlantic coast. The salt-water plants of Onondaga Lake and Salt Creek, near Montezuma, have been discussed by Clinton, Paine, and others. The flora of the marl-formations of Junius, Seneca County, as well as Bergen Swamp, have been discussed by Judge Day and Professor Dudley and in the Flora of Monroe County. Nothing has been published on the floras of the sand-dunes at the eastern end of Lake Ontario. The plants and conditions under which they grow are practically identical with the plants and conditions as set forth by Cowles and others in their accounts of sand-dune regions about Lake Michigan. The affinity of this region to dune regions of the Atlantic coast is obvious, as shown by the presence of a long list of identical species.

Sylvan Beach in Oneida Lake is an extensive sandy beach on which also occur many of the species found in the sand-dunes of the Great Lakes and the Atlantic coast.

Plants with no Apparent Cause for Limited Range. — Excluding plants of the two categories already discussed and taking up plants with no apparent reason for their limited range, it will be found that there are few if any plants endemic to this region, — also that there are still many localized species. The reason for their present distribution is an interesting subject for consideration.

In the first place it may be pointed out that while both the highland and lowland regions have many localized plants, one and the same species is scarcely ever localized in both regions. Either a localized species of the uplands does not occur in the lowlands, and *vice versa*, or a species localized in the highlands will be relatively abundant in the lowlands, and *vice versa*.

Many species could be taken to illustrate this. A few will suffice:

	Uplands	Lowlands
Sagittaria subulata	none	rare
Rhexia virginica	"	"
Jeffersonia	rare	none
Hydrastis	"	"
Eleocharis mutata	none	rare
Juncus subterminalis	"	"
Solidago lanceolata	rare	abundant
Panicum clandestinum	"	"
Decodon verticillatus	"	"

Another interesting thing is the fact that the localized species of the highland region occur with few exceptions in wooded uplands while those of the lowlands are confined to the lakes and water courses and their immediate vicinity. Thus *Prosartes* and *Mertensia* are localized in the highland region and do not occur in the lowlands, while *Hemicarpha*, *Dianthera*, and *Spartina* are localized in the lowlands and do not occur in the highlands.

Looking for the causes for the rarity of these plants, we may at once eliminate climate, as the climate, both as regards temperature and humidity, is practically uniform for both regions. That edaphic factors play an insignificant part seems probable, although

the lowland region has a much more sandy soil than the upland. That the localized plants of the lowland region were brought in by aquatic birds or other animals from the Atlantic coastal regions through the Hudson and Mohawk valleys seems most probable, since those valleys form a natural water-way in this region. The localized plants are at the extreme limit of their northern range. The waters have not only facilitated introduction but tended to modify temperature, thereby enabling these species to maintain a foothold. What water has done for the localized plants of the lowlands the leaf-mold of the forest floor has done for the localized plants of the uplands.

CONCERNING WOODWARDIA PARADOXA, A SUPPOSEDLY NEW FERN FROM BRITISH COLUMBIA

By L. M. Underwood

European fern study neglects or denies the usefulness of two features that American botanists have learned to make of prime importance. The first of these is *type locality* and the second is the necessity of *accurate citation*. Not long ago the writer had occasion to deliver a polemic on some of the carelessness of continental botanists with regard to this matter.* Two years ago I was told by the worker at Kew, whose latest utterance I am here obliged to criticize, that there was enough to do of "real work" not to make it needful "to be hunting up old names, types of genera and species, and type localities." It is just this neglect of old names and type localities that causes some of my British friends to play fast and loose in the matter of making useless redescriptions of plants as new that were long since described. Some time ago † I called attention to the fact that when Baron Eggers collected a *Lygodium* in Hispaniola, the first thing Mr. Baker did was to describe it as new without stopping to look up Hispaniola as a type locality for other possible species of

* A much-named Fern. Torreya 5: 87–89. 1905.

† Bull. Torrey Club 29: 620. 1902.

Lygodium. This we have since been obliged to do, and quickly found that as early as 1810 Willdenow had described *Hydroglossum oligostachyum* (*Lygodium oligostachyum* Desv.), based on Plumier's figure of 1703, from that island. On comparing Eggers' plant with that plate it matched exactly and so *Lygodium gracile* Baker fell into needless synonymy.

Now we have an even more aggravated case from our American northwest coast from which one would naturally be wary in describing new species of ferns, since it has been well collected over since the time of Menzies, Scouler, and Douglas. However, a plant from an Irish greenhouse cultivated from British Columbia comes to Kew and it is promptly described as a new species, *Woodwardia paradoxa* Wright,* apparently without looking up either recent American literature on the subject, or what is still more important, the literature of the past generation. This is all the more inexcusable now, for we have Christensen's admirable *Index Filicum*, and while it fails to give the type locality of the species it catalogues, it nevertheless gives citations accurately, so that anyone who wishes to avoid duplication of names can do so with a minimum of extra labor. Since the possibilities of American fern cultivation have become extensive, and we have had opportunity to cultivate *Woodwardia radicans* of the Old World side by side with the plant of the Northwest, we have been able to see at once, as Mr. Wright has also done, that the two species are absolutely distinct. Instead of dashing off a description of a new species, the first thing the American does is to look up the synonymy and type localities of any species that the writers of the past have needlessly reduced to synonymy. We naturally commence with the Hookerian school of fern students, whose proclivities for lumping species into general synonymy are notorious, and whose work has served to mislead the fern world by their hasty practices. We easily found that two species had been thus reduced: (1) *Woodwardia Chamissoi* Brack. (1854) with a type locality in "Monterey and San Francisco; also in mountains, on the upper waters of the Sacramento River, California," and (2) *Woodwardia spinulosa* Mart. & Gale-

‡ Gardeners' Chron. III. 41 : 98. 16 F 1907.

otti (1842) with a type locality, Orizaba, Mexico. Since 1900 Americans have not only considered these plants distinct from the *Woodwardia radicans* of the Old World, but have considered them as synonyms after an examination of a wide series of material from the entire range of the Sierra foothills from Guatemala to British Columbia.* Taking, however, only the species whose type locality is nearest British Columbia, let us see what Brackenridge wrote about it over fifty years ago. He says, among other things (Wilkes' Expl. Exped. Botany **16**: 189. 1854). "Veins of a pale color, transparent, and not anastomosing more than twice; the venules towards the margin parallel and free." These are exactly the characters on which Mr. Wright depends for his so-called new species.

But Brackenridge says further: "This has been referred by Kaulfuss to the *Woodwardia radicans* of Swartz [*sic*] in which he is followed by Hooker and Arnott, in the Botany of Beechey's Voyage; while we cannot but consider the Californian plant as a distinct species, on account of the erect fronds, the total absence of any proliferous bud on the rachis, the more falcate segments, with a wide sinus, rounded at the base, and the pale veins which are not so compoundly reticulate." In this he almost exactly reproduces a number of Mr. Wright's secondary characters. *Woodwardia paradoxa* is thus the third name for our West American chain-fern.

Everyone will make mistakes sometimes but after the necessity of searching type localities, making exact citations, examination of types, and care of existing synonymy has been hammered into the heads of Europeans for a decade, why will they go on and make needless synonyms after this fashion, especially in such small genera as *Woodwardia?* I am sure the English practice in the seed-plants is not like this, at least so far as it relates to American plants, but among the ferns, the Hookerian system of the past seventy years has reduced species to synonymy to redescribe them anew over and over again. Fée's works at Kew are pen-

* *Cf.* Maxon. List of Ferns and Fern Allies of North America, North of Mexico. Proc. U. S. Nat. Mus. 23: 635. 1906; also Christensen, Index Filicum, 658. 1906.

cilled after his new species " = this or that species" and a lot of them have been redescribed as new, when the plant actually came to hand. Is it any wonder that Christensen has over 22,000 names for a little less than 6,000 plants? The practical lesson of the story is:

1. Make a study of geographic distribution in its relation to specific limitations.*

2. Consider type locality as a fundamental part of a plant description. It is the lack of this element that makes Christensen's *Index* just short of the ideal.

3. Beware of any species with a wide range as recorded in *Synopsis Filicum* or that has an extended synonymy † either there or in *Species Filicum*; there are few species of world-wide distribution and there will be sure to be something wrong with wholesale slaughter; these are danger marks not to be disregarded.

4. Synonyms and homonyms are still important factors in taxonomy.

We commend the above suggestions to the prayerful attention of European fern students.

A HYBRID LESPEDEZA

By Kenneth K. Mackenzie

Ten years ago, while on a botanical trip in southern Missouri, I ran across a procumbent *Lespedeza* with yellowish flowers. The plant was rare and was referred to *Lespedeza hirta* (L.) Ell., with many misgivings. Later, in an article on the Lepedezas of Mis-

* Scores of plants from America have been referred to species originally described from Mauritius. Such a conception of geographic distribution is absurd on the face of it, and every new examination of types from the two countries only serves to confirm their distinctness. One great desideratum of American fern students to-day is authentic material from Mauritius to enable us to straighten out the Hookerian muddles of just this sort.

† In the present case the citation of Brackenridge was more simple at Kew than it would be in New York, since Kew is one of the fortunate institutions that possesses a copy of the rare work of Brackenridge on the Ferns of Wilkes' Exploring Expedition. Here at New York we have to consult the nearest copy at New Haven, or else as in the present instance trouble Yale's obliging professor of botany, Dr. A. W. Evans, whose kindness in furnishing quotations I most thankfully acknowledge.

souri (Trans. St. Louis Acad. Sci. **12** : 11) Mr. B. F. Bush and myself were obliged again to refer this plant as above, as "a slender decumbent form."

In the years since this collection I had never until this last year seen another specimen of this peculiar plant either living or in any herbarium. My pleasure therefore can be imagined when in botanizing on the high rocky hill about a mile to the west of the D. L. & W. R. R. station at Mt. Arlington, Morris County, New Jersey, the plant was again found in much the same situation as before. Again it was rare, but the one or two plants seen were large, vigorous, and conspicuous. In aspect the plants had a strong resemblance to *Lespedeza repens* (L.) Bart., the long procumbent stems spreading for a distance of 5–9 dm. in every direction from a common center. The yellowish-white flowers and the longer sepals, however, at once showed that the plant could not be referred here. On the other hand, the procumbent character of the plant, its much greater slenderness in all its parts, its much less developed inflorescence and shorter, less hairy sepals forbade its continued reference to *Lespedeza hirta.* In fact, it can best be described as very nearly exactly intermediate between the two widely separated species referred to above.

In view of the rarity of the plant, of its occurrence in both stations where found with *Lespedeza hirta* and *L. repens*, and of its intermediate characters, I have come to the conclusion that this plant is a natural hybrid between these two species and would here describe it as follows :

Lespedeza hirta × repens

Perennial with many procumbent stems 6–9 dm. long, radiating from a common center : stems pubescent, but little branched, slender : leaflets oval or elliptic, strongly appressed-pubescent on both sides, the larger 2–2.5 cm. long, about 1.5 cm. broad, rounded (not retuse) at apex, mucronulate, exceeding the petioles : flowers in slender rather few-flowered spikes, on peduncles 2–5 cm. long and much exceeding the leaves : sepals appressed-pubescent, the margins ciliate, linear-lanceolate, 3 mm. long, about one-half the length of the corolla : corolla yellowish-white, the standard with a purplish spot in the center, and the tips of the

wings and keel more or less tinged with purple; wings and keel nearly equal, exceeded by standard: either abortive petaliferous spikes or undeveloped apetalous flowers occur in the axils of some of the petioles: no pods seen.

Specimens seen: New Jersey, Mt. Arlington, *no. 2328*, *Mackenzie*, 26 August, 1906; Missouri, Eagle Rock, *Mackenzie*, 28 September, 1896.

SHORTER NOTES

Corallorhiza maculata Rafinesque. — In *Leaflets* (**1**: 237. 1906), Professor Greene takes up the name *Cladorhiza maculata* Raf. (Am. Mo. Mag. **1**: 429. 1817) for the species long known as *Corallorhiza Wisteriana* Conrad (Journ. Philad. Acad. **6**: 145. 1829), and makes what purports to be the new combination *Corallorhiza maculata*. Rafinesque's description, though brief, cannot, as Professor Greene indicates, refer to any other species of the genus in the northeastern states. That Rafinesque first noticed the species in the vicinity of Philadelphia, as Professor Greene surmises, seems doubtful in the light of a second note by Rafinesque, in which he writes:

"*Coralorhiza maculata*. Roots branched, palmate articulate, stem round, sheaths acute; raceme loose, flowers drooping, sepals lanceolate, nearly obtuse, labellum recurved elliptic white, red spotted, auriculated on each side of the base, toothed and obtuse at the apex. * * * This grows in the shady woods of Long Island near Flatbush, Flushing, Oyster-bay, etc.: it blossoms in July and August, the whole plant is yellowish, size about one foot." (Am. Mo. Mag. **2**: 119. D 1817.) This gives a definite type locality for the species and it would be interesting to know whether the species is still to be found in the localities indicated by him.

Homer D. House.

Clemson College, S. C.

Ipomoea triloba L. in the Philippines. — In 1837, Blanco described a Philippine plant, which seemed to him distinct from any Linnaean species, as *Convolvulus dentatus*. As this name

was long preoccupied by a species of Vahl, it was changed by Choisy to *Ipomoea Blancoi*, which name has since been used. The compilers of the third edition of the *Flora de Filipinas*, not suspecting the identity of Blanco's species, enumerated and figured it as *I. commutata* Roem. & Schult., to which it is very closely allied. By Choisy, who knew it from the original description only, it was included among the species insufficiently known, but recently abundant material has been collected, and some time ago Mr. Percy Wilson called my attention to its resemblance to the tropical American *I. triloba*. Investigation showed that nearly parallel series of its somewhat wide variations occurred in both regions, and that *I. Blancoi* must be reduced. Hallier has recognized it as American, but apparently without definite identification.

The synonymy as regards Philippine botany, is as follows:

IPOMOEA TRILOBA L. Sp. Pl. 161. 1753.

Convolvulus dentatus Blanco, Fl. Filip. 89. 1837; ed. 2. 66. 1845; ed. 3. **1**: 123. 1877; Walp. Linnaea **16**: Litt.-ber. 15. 1842. Not *C. dentatus* Vahl, Symb. Bot. **3**: 25. 1794.

I. Blancoi Choisy in DC. Prodr. **9**: 389. 1845; Miq. Fl. Ind. Bat. **2**: 619. 1857; F.-Vill. Noviss. App. Fl. Philipp. 142. 1883; Merr. Bur. Govt. Lab. Publ. **6**: 26. 1904; Merr. *loc. cit.* **27**: 63. 1905. Merr. Philipp. Jour. Sci. **1**: Suppl. 119. 1906.

I. commutata Naves in Fl. Filip. ed. 3. *pl. 31.* 1877; F.-Vill. Noviss. App. Fl. Philipp. 142. 1883. Not *I. commutata* Roem. & Schult. Syst. **4**: 228. 1819.

I. Batatas Usteri, Viertel. Naturf. Ges. Zürich **50**: 122. 1905. Not *I. Batatas* Poir. Encycl. **6**: 14. 1804.

Since, in Asia, this species seems to be confined to the Philippines, there can be no doubt that the original home is in America. But in Blanco's time it was already very common in the former region, so that it must have been introduced at an early date. It is now known there from several collections, those represented in the herbarium of the New York Botanical Garden being:

LUZON: Bauang, Province of Union, *Elmer 5607*, *5726*; Manila, *Merrill 380*, *638*; Pasig, *Usteri 564*; Los Baños, Province of Laguna, *Williams 2025*, *Elmer 8271*.

MINDORO: Pola, *Merrill 2450*.

In tropical America its range is rather wide, extending from Arizona and southern Florida through Mexico and the West Indies to Brazil.

C. B. ROBINSON.

NEW YORK BOTANICAL GARDEN.

A TILIA FROM THE NEW JERSEY PLEISTOCENE. — In the Flora of the Amboy Clays, Professor Newberry described a single imperfect leaf from Fish House, N. J., under the name of *Tiliaephyllum dubium*, remarking that it was very distinct from any other plant yet found in the Amboy Clays and that it resembled some leaves of the basswood, such as could be collected in almost any forest.

In the Annual Report of the State Geologist of New Jersey for 1896, the year that Newberry's monograph was finally issued, Mr. Lewis Woolman discusses in great detail the stratigraphy of the Fish House clays and their fossils, conclusively showing that the dark clays at Fish House are of Pleistocene age and not Cretaceous, as they had been regarded by Lea, Whitfield, Uhler, Newberry, and others. However, the Cretaceous is directly beneath these Pleistocene clays, and at the present time the floor of the pit consists of a somewhat indurated layer forming the contact with what is now called the Magothy Formation of Upper Cretaceous age, but which in Newberry's day was not differentiated from the Amboy Clays or Raritan Formation. Since the lighter Cretaceous clays underlie the dark Pleistocene clays at this point it was not possible for Woolman to determine from which bed the basswood leaf had come, as no additional specimens were found by him, the presumption being, however, that it came from the Pleistocene.

During the past year or two the writer has visited this most interesting locality as occasion has offered, each time making a careful search for plant fossils. It cannot be said that such search proved very successful. A fragmentary maple leaf (*Acer*) was collected at one point, and the clay was found to contain in places a large number of seeds, of which only the gum (*Nyssa*) has thus far been definitely recognized. Fortunately, however,

several imperfect specimens of Newberry's leaf were found, which were characteristic enough to prove that it had come originally from the Pleistocene and is not a member of the Cretaceous flora.

The recognizable plant remains are contained in an interbedded stratum of very compact clay, which is considerably lighter in color than the bulk of the clay and dries to a buff-drab color. The horizon is the same as that carrying the abundant Unios and Anodontas for which the locality is famous. The largest fragment of a *Tilia* leaf is 12 cm. long and 6.5 cm. wide and lacks the tip and a large part of the margin. Together with the shell of a huge *Anodonta*, or freshwater clam, 15 cm. by 9.5 cm., it forms a cleavage plane in the hard clay, one side of the leaf being concealed by the ventral margin of the clam shell.

It seems desirable that this leaf shall be transferred to the modern genus, and while it undoubtedly represents a still existing species, either *Tilia americana* L. or *Tilia heterophylla* Vent., it has not been possible satisfactorily to determine which, so that Newberry's specific name may stand, at least for the present. This will give us the following as the correct citation for this species:

Tilia dubia (Newb.)

Tiliaephyllum dubium Newb. Fl. Amboy Clays, 109. *pl. 15. f. 5.* 1896. Woolman, Ann. Rep. State Geol. N. J. **1896**: 212. 1897.

EDWARD W. BERRY.

BALTIMORE, MD.

REVIEWS

Henshaw's Mountain Wild Flowers of America*

This beautifully illustrated book will prove of great interest and usefulness to those who contemplate spending a summer vacation in the higher mountainous regions of North America. What the full-page illustrations of mountain flowers do not supply, when it is desired to identify some interesting alpine plant, the brief, but terse, descriptions will furnish. As the book is intended for the general public, the plants are not arranged scientifi-

* Henshaw, Julia W. Mountain Wild Flowers of America. Pp. i–xxi + 1–384. Pl. 1–99. Ginn & Co., Boston. 1906.

cally, but are grouped together by the color of their flowers. The white to green flowers form one section of the arrangement, the pink to red another, while the blue to purple flowers, yellow to orange flowers, shrubs and miscellaneous plants, form other sections of the book, which is provided with useful indexes of the scientific and common English names.

JOHN W. HARSHBERGER.

PROCEEDINGS OF THE CLUB

FEBRUARY 27, 1907

The Club was called to order at 3:30 P. M. at the museum building of the New York Botanical Garden, with Dr. William A. Murrill in the chair. Twenty-one persons were present.

The names of Dr. Ernst A. Bessey, Subtropical Laboratory, Miami, Fla., and Dr. William Mansfield, College of Pharmacy, N. Y. City, were presented for membership.

Dr. Herbert M. Richards, chairman of the committee appointed to arrange for the reception given on December 26, 1906, to botanists in attendance upon the scientific meetings of Convocation Week, presented a report. The report was accepted and ordered placed on file, and the committee was discharged.

Resignations were received from Mr. S. Mendelson Meehan, Germantown, Pa., and Miss Dorothy A. Young, 38 Park Ave., Passaic, N. J. The death of Mr. Walter S. Logan, which occurred on July 19, 1906, was reported.

On motion the secretary cast the ballot of the club, electing Dr. Bessey and Dr. Mansfield to membership.

The following scientific program was presented:

"Tubular Glands in the Corn Embryo," by C. Stuart Gager.

The literature dealing with the transformation of starch to sugar in the corn grain during germination was first briefly reviewed, and its bearing on the structural anomaly subsequently described was pointed out. This anomaly consisted of invaginations of the glandular epithelium of the scutellum into the tissue of the latter, in such a way as to form true glands of the tubular and subracemose type.

The significance of these glands, as in harmony with the theory that the scutellar epithelium is principally an organ of secretion, was also indicated. The paper was illustrated by microscopic preparations and photomicrographs, and will be published in full in the *Bulletin* of the Club.

A brief discussion followed.

"Explorations in southern Florida," by John K. Small.

The exploration was confined to the larger group of islands lying between Miami and camps Longview and Jackson, and to a wholly unexplored section of the everglades lying between the present terminus of the Florida East Coast Railway and Key Largo, including a portion of Cross Key. This latter island, together with a parallel and almost similar formation, constitutes the only natural and approximately complete land-connection between the Florida Keys and the mainland of the peninsula. The chain of everglade keys is a miniature of the Florida Keys, both in its crescent shape and its flora, and also of the West Indies in the character of its vegetation. It is surrounded by the everglades, except where the upper islands touch Biscayne Bay at points from Miami to Cutler. Before these islands were elevated to their present altitude, they were probably surrounded by a shallow sea, just as the Florida Keys are at the present time. This being the case, the tropical American flora now inhabiting them may easily be accounted for. After sufficient elevation had taken place, the surrounding sea was transformed into the vast spring now known as the everglades. Conditions becoming favorable, the plants of the flora of northern peninsular Florida advanced southward and naturally took complete possession of the area that was formerly the sea, thus surrounding and isolating the wholly different flora of the islands. In fact, the two floras are so sharply delimited that one can often stand with one foot on plants characteristic of the high northern regions and the other on plants restricted to the tropics. It is not an uncommon experience to see colonies of plants common in Canada, such as the arrow-arum (*Peltandra*), the lizard's tail (*Saururus*), and the ground-nut (*Apios*), growing side by side with tropical palms, cycads, orchids, and bromeliads.

The total area of these islands is perhaps about one hundred and fifty square miles. Those that have been explored have yielded between five and six hundred species of native flowering plants, surely a very large number considering the fact that the solid rock is exposed everywhere and that soil in the ordinary sense of the word does not occur there. The close relationship of this flora to that of the West Indies is now established by the fact that considerably more than one half of the species found on the islands south of Miami are also native in Cuba and the Bahamas.

Since the publication of Dr. Small's last report on exploration in southern Florida, and a subsequently printed paper on the species added to the flora of that state, he has secured over fifty more species not before known to grow on the North American mainland. Eight or ten of these are complete novelties, inasmuch as they are not yet described. Noteworthy among the recent collections, which make an aggregate of 3,200 specimens, are seven specimens not previously included in the tree flora of the United States.

After an interesting discussion of Dr. Small's paper the Club adjourned at five o'clock. C. STUART GAGER,

Secretary.

MARCH 12, 1907

The Club met at the American Museum of Natural History at 8:15 P. M., with President Rusby in the chair. Ten persons were present.

The reading and approval of the minutes for February 27, 1907, was followed by the presentation of the name of Mrs. Samuel Weiss, Depot Lane, Washington Heights, N. Y. City, for membership.

The resignation of Mr. H. M. Stephens was read and accepted. On motion the secretary cast the ballot of the Club electing Mrs. Weiss to membership.

The following scientific program was presented :

" Remarks on Regeneration," by Miss Elsie M. Kupfer.

The various meanings which have been assigned to the word regeneration were first discussed. It was brought out that, while

some writers would limit the term to the restoration of embryonic tissue in root and shoot, others would include within the scope of the process merely the development of buds present before injury. It seemed best to take the middle ground and consider as a regeneration any organ formed anew after injury or loss.

The different plant organs were used as cuttings and their behavior examined when buds were absent. On the roots which formed shoots it was found that these were not confined to the upper (basal) surface, but could appear from the apical as well, or from the middle of the root. The roots of less than half of the species used formed shoots, while all produced roots not always as true regenerations, but as outgrowths from the uninjured cambium. Budless stems proved able to root with ease but were unable to replace the buds which had been cut out. Such parts continued growing for fifteen months without undergoing any tissue change, while a part on which a single bud was left established secondary vascular strands between the bud and the new roots. The pseudobulb of an orchid proved able to regenerate roots and a shoot from the base, and in a conifer the apparent "restoration" of a single root on the seedling and in an older stem-part was described. Of eighty-two species of leaves used in experimentation only two new ones were found which produced a shoot, though the large majority formed roots. Modified leaves of various types, such as phyllodes and bulb-scales, were also found to be able to root. Regeneration was likewise reported in the inflorescence of *Dudleya californica* and *Ruellia rosea*, in the fruits of *Phaseolus vulgaris* and *P. lunatus*, and finally in the "head" of the alga *Penicillus capitatus*.

An extended discussion followed.

Owing to the lateness of the hour, Dr. Rusby did not present his paper on "Field Observations of the Past Year," but exhibited a few interesting plants collected at Oscoda, Michigan.

Dr. Southwick exhibited several interesting specimens of the seeds of *Ricinus*.

The meeting adjourned at ten o'clock.

C. Stuart Gager,
Secretary.

NEWS ITEMS

Professor Francis E. Lloyd, of the Desert Botanical Laboratory, will conduct a botanical course next July in the summer school of Harvard University.

At Barnard College, Columbia University, Dr. Tracy E, Hazen has been promoted from tutor to instructor in botany. and Miss Marion E. Latham from assistant to tutor in botany.

Dr. D. T. MacDougal, director of botanical research in the Carnegie Institution of Washington, has recently made an expedition to the Salton Sea in southern California and to adjacent parts of the delta of the Colorado River in Baja California.

Dr. Tracy E. Hazen of Barnard College gave a lecture on "The Evolution of the Green Algae" at the Brooklyn Institute of Arts and Sciences on March 20. The lecture was repeated on April 3 before the Barnard Botanical Club.

Mr. William R. Maxon, of the United States National Museum, left Washington on March 24, intending to spend two months in making botanical collections in eastern Cuba, in coöperation with a party of topographical engineers of the United States Army.

It is announced in *Science* that Dr. Bradley M. Davis has resigned his connection with the Marine Biological Laboratory at Woods Hole, Mass., and that Dr. George T. Moore of West Chester, Pa., will be in charge of the botanical department of that institution during the present summer.

Miss Mary Perle Anderson, instructor in botany in Mt. Holyoke College, who has been pursuing special studies during the present year in Columbia University, has been appointed critic teacher of biology and nature-study in Teachers College of Columbia University. Miss Anderson will spend the coming summer in Europe, where she will visit several of the larger herbaria and botanical gardens.

Busts of ten American men of science were unveiled at the American Museum of Natural History, with appropriate exercises, on December 29, the ten chosen to be thus commemorated being Franklin, von Humboldt, Audubon, Torrey, Henry, Agas-

siz, Dana, Baird, Leidy, and Cope. The brief memorial addresses delivered on that occasion and photographs of the busts are published in the April number of *The Popular Science Monthly*. Dr. Nathaniel L. Britton gave the address on John Torrey.

The New York Academy of Sciences will commemorate on May 23, the two hundredth anniversary of the birth of Linnaeus. In the morning of that day there will be addresses at the American Museum of Natural History and an exhibition of animals, minerals, and rocks known at the time of Linnaeus; in the afternoon, in Bronx Park, there will be addresses and exhibits at the Botanical Garden and the Zoölogical Park and the dedication of the Linnaean Bridge; in the evening, there will be simultaneous exercises at the Museum of the Brooklyn Institute and at the New York Aquarium.

Dr. Melville T. Cook, recently in charge of the department of plant pathology in the Estación Central Agronómica de Cuba, and for the past few months engaged in research at the New York Botanical Garden, has been appointed professor of botany in Delaware College and plant pathologist in the Delaware Agricultural Experiment Station. Dr. Cook's work, which began April 1, will be chiefly research, under the provisions of the Adams Act. His special work for the present will be on the "crown gall" of the cultivated species of *Rubus*, which has caused serious losses to the fruit-growers of Delaware.

Dr. and Mrs. N. L. Britton and Dr. C. F. Millspaugh returned during the last week in March from a successful botanical survey of some of the outer islands of the Bahamian archipelago. Visits were made to Eleuthera, Little San Salvador, Cat, Conception, Watlings and Long Islands. This was the fourth in the series of expeditions made by Dr. Britton to the Bahamas, and the third by Dr. Millspaugh. The large amount of material thus brought together, supplemented by collections made for the New York Botanical Garden by Nash and Taylor and by Brace, and the earlier collections of the Northrops, of Hitchcock, and of Coker, will serve as a tolerably satisfactory basis for a descriptive treatment of the interesting flora of these islands.

Dr. Otto Kuntze died suddenly at San Remo, Italy, on January 28. He was in his sixty-fourth year, having been born in Leipsic, June 23, 1843. Dr. Kuntze was a pharmacist in early manhood and is said to have acquired a comfortable fortune by the age of thirty through the manufacture of ethereal oils. Meanwhile, he had developed much interest in systematic botany and as early as 1867 published a "Taschen-Flora von Leipzig." In 1874–'76, he made a journey around the world for botanical observation and collecting, and on his return studied in Leipsic and Berlin and in 1878 received the degree of doctor of philosophy from the University of Freiburg, his dissertation being a "Monographie der Gattung Cinchona L." He afterwards published an account of his journey, a monograph of the genus *Clematis*, and a revision of the genus *Sargassum*. Subsequently he made other extensive botanical journeys, the two most important being to South America in 1891–'92 and to southern and eastern Africa in 1894. In determining the plants collected on these expeditions, Kuntze became impressed with the wide diversities of usage in the matter of plant-nomenclature and took strong ground in favor of the priority principle, embodying his views in his "Revisio Generum Plantarum," which appeared in three volumes in 1891–'98. This work, which involved a vast amount of bibliographical research, was based on the so-called "Paris Code" of 1867, to which, by certain amendments, he attempted to give more definiteness and precision. Kuntze's "Revisio" and his numerous subsidiary papers on nomenclatural questions have had a wide influence with botanical systematists, though not wholly in the direction intended or anticipated by their author. His intolerance of opposing views and his imperfect command of some of the foreign languages in which his polemics weie published, contributed to his peculiar distinction in the botanical world, but detracted somewhat from the serious consideration to which his opinions were entitled. Dr. Kuntze had been for several years on the active membership list of the Torrey Botanical Club. His last visit to the United States was in the summer of 1904.

OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

---

(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 33, published in 1906, contained 635 pages of text and 26 full-page plates. Price $3.00 per annum. For Europe, 14 shillings. Dulau & Co., 37 Soho Square, London, are agents for England.

Of former volumes, only 24–33 can be supplied entire; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Vols. 24–27 are furnished at the published price of two dollars each; Vols. 28–33, three dollars each.

Single copies (30 cts.) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–11 and 13 are now completed and Nos. 1 and 2 of Vol. 12 have been issued. The subscription price is fixed at $3.00 per volume in advance. The numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **The Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

THE TORREY BOTANICAL CLUB
Columbia University
NEW YORK CITY

Vol. 7 May, 1907 No. 5

TORREYA

A Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE AND PHILIP DOWELL

JOHN TORREY, 1796–1873

CONTENTS

Published for the Club
At 41 North Queen Street, Lancaster, Pa.
by The New Era Printing Company

[Entered at the Post Office at Lancaster, Pa., as second-class matter.]

THE TORREY BOTANICAL CLUB

TORREYA is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, fifteen cents. To subscribers elsewhere, five shillings, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to TREASURER, TORREY BOTANICAL CLUB, 41 North Queen St., Lancaster, Pa., or Columbia University, New York City.

Matter for publication should be addressed to

MARSHALL A. HOWE
New York Botanical Garden
Bronx Park, New York City

Vol. 7. No. 5.

TORREYA

May, 1907

THE RATE AND PERIOD OF GROWTH OF POLYPORUS LUCIDUS *

By C. W. Edgerton

Very little has been done by botanists in regard to rate and period of growth among members of the higher groups of fungi. Miss Douglas (2) in 1906 studied the growth of *Panaeolus retirugis*, one of the agarics, under greenhouse conditions. Schmitz (4) in 1842 worked on a number of forms, both agarics and *Polypori*. Fries (3) had made the statement that fungi grow from the center outwards. Schmitz took exception to this, and by marking spaces of known size on such forms as *Polystictus hirsutus* and others, he was able to show that the growth was in the periphery and not the center. Beyond these, the literature relating to the growth of the higher fungi is very scanty.

It was to find out as much as possible concerning the phenomena of growth in these forms, especially the woody members, that this study was undertaken. Little was known definitely concerning the rate of growth, the growing period, the effects of external conditions, or for that matter even the actual position of the growing area. In some perennial forms, such as *Fomes fomentarius* and others in which a layer is added each year, it is an easy matter to obtain the yearly increase. But in these, the growth is so slow that it is impossible to obtain reliable data on the other points just mentioned. A form growing in abundance around Ithaca, N. Y., that seemed to be very well adapted for such a study was the so-called *Polyporus lucidus* (Leys.) Fr.† Its

* Contribution from the Department of Botany, Cornell University, No. 120.

† This is the name by which the fungus is commonly known in this country. However it has recently been described by Dr. Murrill in Bull. Torrey Club 29: 601. 1902, as a new species, *Ganoderma Tsugae*.

[No. 4, Vol. 7, of Torreya, comprising pages 69–88, was issued April 15, 1907.]

growth is extremely rapid for one of these firm fungi, and consequently any change of any kind in growth that might occur would be easily noticed. The fungus, as was mentioned above, is a common one in the vicinity of Ithaca, sometimes found in large numbers in damp woods and gorges on dead stumps and trunks of hemlocks. It is one of the stalked *Polypori*, characterized by the red varnished appearance of the stalk and pileus. At maturity, which is always in the first year, it being an annual at least in the north, it becomes very hard and brittle.

Growth in this form begins early in the spring, it being one of the first to start. The fungus breaks through the outer layers of wood and bark and makes its appearance as a soft white round button or ball of mycelium some time in May or early June, though the date is somewhat dependent on external conditions. This button is at first nearly spherical, perhaps a centimeter or less in diameter. As to color, it is perfectly white, being as yet without a trace of the red varnish which characterizes its later stages. It is not until the plant has reached a length of one and a half to two centimeters that it begins to take on the varnished character. The varnish forms on the older parts of the plant, the young growing part always remaining white. This is characteristic of the plant through its entire development. It has a white zone of growing tissue at the margin, while the basal older parts are covered with the varnish. After a part assumes this condition, it is incapable of further growth. A number of buttons were noticed, which, probably on account of unfavorable weather conditions, had ceased to grow and had become covered with the varnish. Although these were not more than one centimeter in diameter, they remained unchanged the whole season.

The growing period is confined to the spring and early summer months. It rarely extends to the first of August, though perhaps under favorable conditions it may grow for a longer period, and generally stops by the middle of July. The growth takes place at the extreme edge of the fungus. It is the result of adding more tissue to the outside, or in other words it is exogenous. After a part or zone is once formed, it is incapable of further

growth. No matter how close to the margin a mark was placed, all the growth was outside of it. For instance, spaces one millimeter apart were marked on the pileus with India ink. On examination a few days later, it was seen that all the growth had taken place in the outer millimeter. The other spaces had not increased in size.

This manner of growth is unusual in other families of the plant kingdom. In all higher plants, the zone of growth is located a little distance back from the apex of the growing point. Also in the agarics among the fungi, we find a method similar to the higher plants in the elongation of the stipe. According to Miss Douglas and also Schmitz, the most rapid growth is in a zone slightly below the apex of the stem, and from this zone, growth is less marked as the base of the stem is approached. But the stems of the agaric and of the polypore seem to be different and are not comparable from the standpoint of growth. In the agaric, the hymenium is formed and the growth of the stem merely raises this up above the ground where the wind may catch the falling spores. In *Polyporus lucidus*, the stem is the first part formed and is perfectly developed before the hymenial surface starts to form under the pileus. If we are to compare the growth in the two forms, we should compare it in the young pilei in both cases before and while the hymenium is forming. In the agaric, this will exclude the elongation of the stipe, while in the *Polyporus*, it will include nearly the whole development of the plant. Whether the growth and development of any of the agarics is similar to the method we have seen in *Polyporus lucidus* is a question. It is surely not in all cases for Atkinson (1) has shown that in *Agaricus campestris*, there is an endogenous development in the pileus in the early stages. The latter is very different from the exogenous development in *Polyporus lucidus*. Other forms of agarics as *Collybia* and *Cantherellus* that have an exogenous development of the hymenium may have a growth similar to *Polyporus lucidus*, but this can be answered only by observation and measurement.

Among the external conditions which may affect growth are temperature, moisture, and nourishment. Temperature has a

decided influence. A long cold period will cause almost a total stopping of growth, though the fungus responds very quickly again to warmth. The effect of temperature will be very clearly shown in FIGURE I. Curve B represents the average growth of twenty fungi from June 7 to June 24, while curve A shows the average daily temperature for the same period, the figures for this being obtained from the local weather-bureau office. As will be seen, the temperature curve contains a decided depression from June 10 to June 13, showing a cold period. The average temperature ranged from 49° to 56° F. during this period, while during the rest of the time it was between 65° and 76°. The effects of this cold period are clearly shown in the lower curve. Growth

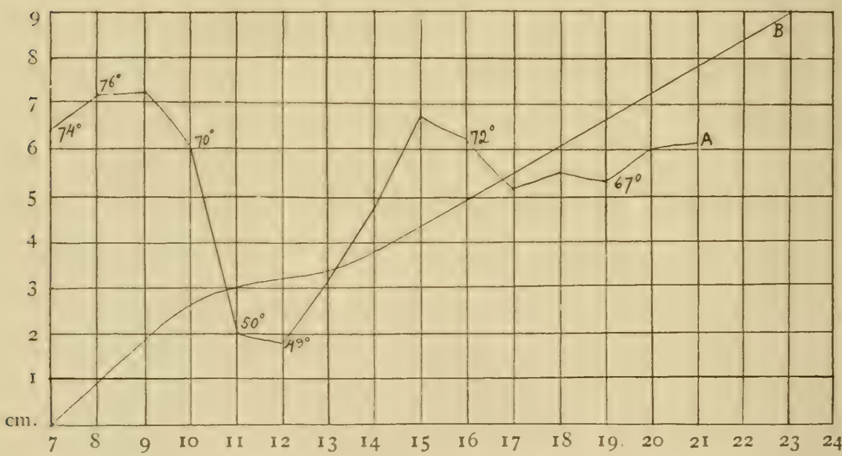

FIGURE I. Curve A represents the average daily temperature from June 7 to June 21, 1906, showing a cold period from June 10 to June 13.

Curve B represents the average daily growth of twenty specimens of *Polyporus lucidus* during the same period. The effect of temperature on growth is shown.

was almost at a standstill. Some individual fungi did go through this period of three days without a measurable increase in growth.

As to moisture and nourishment, we are unable to form an accurate conception of their influence. The fungus grows on logs and stumps which hold a large amount of moisture for some time. It is hardly probable that the lack of moisture is a factor until the logs begin to dry out in the summer. It may then, and

probably does, have something to do with the stopping of growth at that time. The question of nourishment was not studied, it being impossible to determine the variation in nourishment if there was any.

From the button stage until the plant almost reaches maturity, growth is at a very even rate, as will be seen in the curve in FIGURE 2. Of course the individual fungi vary some, but the average of a number gives almost a straight line. There is an evident depression in the curve, but this is not due to a normal decrease in growth at this period, but due to the period of low temperature above discussed. Of course in making the curve, it was neces-

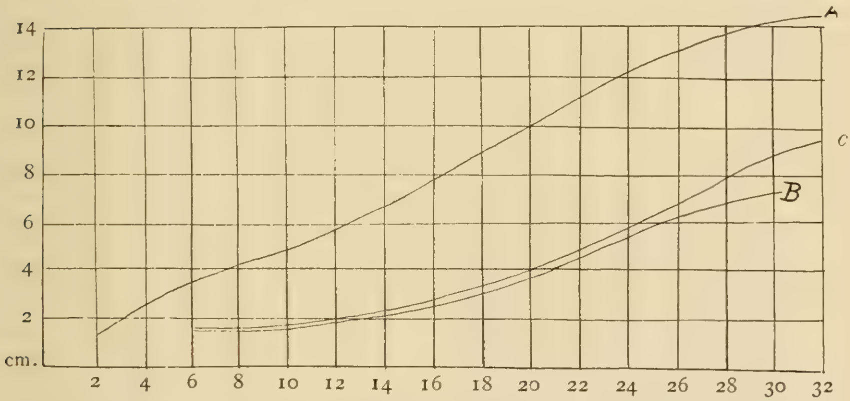

FIGURE 2. A represents the average daily growth of a number of individuals from the button stage to maturity, during a period of thirty-two days. Growth is figured in centimeters.

B represents the increase in length of the white area underneath the pileus, during the same period.

C represents the lateral growth of the pileus during the same period.

sary to start all the fungi of a certain size at a certain place on the curve, for instance all the fungi about 1.2 cm. in length were started at 2 on the curve, whether they began to develop at the same time or three weeks apart. From this point, the curve was plotted, the average daily increment of growth being used for the ordinates and the number of days for the abscissæ. In all of the fungi measured, the cold period came sometime between the seventh and seventeenth days of their development. And as will

be seen, that period shows the depression in the curve. Measurements were not taken on the young buttons until they were about two days old. A number at this age averaged 1.2 cm. in length.

The average growth of this fungus is about one half-centimeter per day. Individual plants sometimes grow as much as a centimeter per day, but this is not common. Compared to other woody forms, a half-centimeter per day is very rapid growth. Most of these are perennial, and the total yearly growth is only a few centimeters at the most. Probably the fastest growing perennial form that we have is the so-called "*Polyporus applanatus*." * Yet from measurements taken during the summer, the fastest growth for any individual was 1.5 mm. per day, while the average growth for a number during the month of August, that being the month in which growth is the most rapid, was 0.7 mm. per day. This is only one seventh as fast as that of *Polyporus lucidus*. Compared to slower growing forms as *Fomes fomentarius* and *Fomes pinicola*, the difference must be much greater.

This extremely rapid growth means a large amount of added tissue each day. The fungus is about one half-centimeter thick at the apex. Taking one that is only twenty-five centimeters in length, we would have added a daily increment of twenty to twenty-five cubic centimeters. This must mean a very rapid utilization and transport of the food materials by the fungus.

As the plant approaches maturity, growth gradually ceases and for the last week or ten days it is very slow. External factors seem to be the cause of the maturing of the plant. For the curve last mentioned, plants were used that came to maturity at a length of about fourteen to fifteen centimeters. If plants had been used that matured at twenty-five centimeters, the only difference in the curve would have been the lengthening of the straight part of it until a height of about twenty-three or twenty-four was reached. The plant seems to be able to keep growing at about the same rate as long as conditions are right. But when conditions are not right, as for instance, lack of moisture or nourishment, the plant takes on the mature condition.

---

* *Fomes megaloma* Lév., or according to Murrill in Bull. Torrey Club **30**: 300. 1903, *Elfvingia megaloma* (Lév.) Murrill.

This is also shown by the fact that quite generally all the plants on a single stump, both large and small, will come to maturity at the same time.

As we have noticed before, *Polyporus lucidus* is one of the stalked *Polypori*, but the length of the stalk is variable with the different plants, some being nearly sessile, while others have very long stalks. The stalk is the first part of the plant to develop. From the button stage, the plant continues to add on more tissue exogenously, all of which becomes covered with the red varnish except about one to two centimeters of the terminal margin, which remains white. However, after the plant has been growing for seven to fifteen days, it will be noticed that the white part on the under side of the plant is becoming longer. It does not become varnished over as fast as it is formed. Or, in other words, the pileus has commenced to form. This is rather a slow process at first, as the cap does not seem to be started all at once, but the varnishing process on the under side gradually slackens up. Consequently as the plant develops, there is left a greater white area beneath. This white area is used in the curve representing the development of the pileus. This area does not all develop into pileus, for that of the first few days of development becomes part of the stalk. It is impossible to tell how much of this white area will be stalk and how much pileus until several days after it begins to increase in size. Then the boundaries of the cap or the hymenial surface become marked out, and consequently thereafter, the increase of the cap equals that of the whole plant. The formation of the pileus does not begin at the same time with all plants, so it is a difficult matter to show its development with a curve. But this was attempted by selecting a number of plants having about the same length of stalk, about six centimeters, and plotting the average increase of the white area on the under side of the pileus. This shows that in plants with stalks of this size, the stalk reaches its complete development between the twelfth and eighteenth days, and also that the boundary of the cap is established between these dates. Of course with a longer or shorter stalk this would vary somewhat. But the curve shows the most important fact, that the formation of the pileus is a gradual process.

About the time the pileus begins to form the plant begins to widen out. Up to this time, the increase by growth had been almost entirely in length. In the increase in width, we find considerable variation, more so than in the increase in length. But the average of a number of plants shows that the lateral growth is but very little faster than the terminal growth. In the increase in width, there are of course two growing zones, both sides adding an equal amount of tissue. Consequently the growth on one side is but slightly over one half what it is on the terminal margin. As a result, the hymenial surface of the mature plant is generally but slightly wider than it is long. Of course, we sometimes find very wide plants but these are quite often due to the fusing together of several small caps that started from the same stalk. Curve C in FIGURE 2 is plotted showing the increase in width, the values being obtained from the average growth of a number of individuals. The curve brings out the facts above mentioned. It is strikingly similar to the one showing increase in length of the pileus. Yet we have two sides increasing in width to only one increasing in length.

In conclusion, we will merely enumerate the results already mentioned: (1) *Polyporus lucidus* is a fast growing member of the Polyporaceae, growth averaging about one half-centimeter per day for the growing period. (2) Growth is exogenous, taking place entirely at the edge of the plant and continuing as long as conditions are favorable. (3) The change in the development from stalk to pileus is a gradual process. (4) The average lateral growth is but slightly more than the terminal growth.

In closing, I wish to acknowledge my indebtedness to Professor Atkinson, at whose suggestion this work was undertaken and carried out.

REFERENCES TO LITERATURE IN THE TEXT

1. **Atkinson, George F.** The Development of *Agaricus campestris* Bot. Gaz. **42**: 241–264. O 1906.
2. **Douglas, Gertrude E.** Growth of *Panaeolus retirugis*. Torreya **6**: 157–165. 1906.
3. **Fries, E.** Syst. Orb. Veg. **1**: 40.

4. **Schmitz, J.** Lebens und Entwickelungsgeschichte einiger Schwämme aus der Klasse der Gastromyceten und Hymenomyceten. Linnaea **16**: 175. 1842.

Cornell University,
Ithaca, New York.

OUR EASTERN SHADWOODS

By W. H. Blanchard

The genus *Amelanchier* is interesting to many people, and botanists are but a small part of them. The flowers are early and showy and the fruit is early ănd quite edible. Throughout most parts of the north temperate zone some form of it occurs, often more than one, and all are much alike. They may be treated as forms of a single species as Michaux, and Torrey and Gray treated our North American forms.

All of the forms of this genus readily and probably naturally fall into two classes. The type of one class is our *A. canadensis* (L.) Medic. This class is characterized by serrate acuminate leaves varying from cordate to cuneate, and naked-topped fruit. It includes *A. asiatica*, *A. oblongifolia* (T. & G.) Roem. and *A. oligocarpa* (Michx.) Roem. The last-named may be made a subclass.

The type of the other class is the European *A. rotundifolia* (Lamarck) Dum.-Cours, synonyms of which are *A. vulgaris*, *A. ovalis* Medic. (1793) and *A. Amelanchier.* This second class is characterized by oblong or rounded leaves, generally dentate and often thick, and woolly-topped fruit. It includes Michaux's *Mespilus canadensis* var. *rotundifolia*, Lamarck's *Crataegus spicata*, Spach's *A. ovalis*, and Nuttall's *A. alnifolia* and the large number of species lately segregated from *A. alnifolia* in the "Far West." All of the characters of these two classes though pretty constant are not always so.

To decide on the names by which the forms shall be called is not a simple matter. They have been described as species and varieties under several generic names, the best known being *Mespilus*, *Crataegus*, *Pyrus*, *Aronia*, and *Amelanchier*, and have often

been transferred from one genus to another. At least forty different specific and varietal names had been applied to them before 1850. With four sets of rules, Vienna, Kew, Rochester, and Philadelphia, and at least as many different interpretations of them, uniformity of names can hardly be expected at present for such varying and poorly studied plants.

There is no complete index to the literature on this genus. Many names are omitted in the Index Kewensis, and even when Watson's Bibliographical Index, Roemer's Synopses Monographicae and Sargent's Silva are also consulted, important references are wanting.

A. CANADENSIS (L.) Medic. There seems to be good reason to adopt this name for our largest form. Linnaeus named it *Mespilus canadensis*, or rather adopted the name. Medicus put it into his genus *Amelanchier* in 1793. But it has another name. When the son of Linnaeus transferred his father's *Mespilus canadensis* to the genus *Pyrus*, for some reason not apparent he gave it a new specific name, *Botryapium*, which De Candolle retained when he transferred it to *Amelanchier*, in 1825, so that *A. Botryapium* is a synonym for this species and is generally used in English nurseries. Torrey and Gray very ingeniously united both names, calling it *A. canadensis* var. *Botryapium*. Some of its other synonyms are quite suggestive of its appearance, such as *arborea*, *racemosa*, and *cordata*. Michaux's specimen of the latter, *M. canadensis* var. *cordata*, as he called it, is very typical; a photograph of it is now in the Gray Herbarium.

A. INTERMEDIA Spach. The smaller forms of *A. canadensis*, generally called "oblongifolia," become under the Rochester Code *A. obovalis* (Michx.) Ashe. The photograph in the Gray Herbarium of Michaux's specimen seems to be typical. If we regard this form or rather these forms as a variety, the name will be *A. canadensis* var. *obovalis*. But if we regard it as a species there seems to be no excuse under the other three rules for disregarding the oldest available specific name which it has received. Spach named it as above in 1834, or four years before Torrey and Gray used the varietal name *oblongifolia*, which Roemer made specific in 1847. Spach gave it a good character-

ization and placed it in his book and described it as intermediate between *A. canadensis* and a species of American *Amelanchier* which he called "*A. ovalis* (*Crataegus spicata* Lam.)."

A dwarf form of this class grows on the rocks at Bellows Falls, Vt., between the two railroad bridges. It is so interesting that it is proposed here as a new species :

Amelanchier saxatilis sp. nov. Small, spreading, partly prostrate shrubs, 1 to 3 feet high, irregularly and abundantly branched ; branches slender, twigs very slender ; breaking buds slim, rather woolly, scales narrow ; bracts rose-color. Leaves very woolly on the lower side when young, glabrous when full-grown, oval, rounded at the base, points short and broad, finely serrate, 1.5 in. long by 1 in. wide. Flowers early, abundant, rather small, well proportioned, 0.75 in. broad, very white, in very numerous, spreading, slender racemes ; peduncle, pedicels, and calyx densely woolly. Petals very narrow, three times as long as wide. Fruit small, ripening early, in slender racemes, top of pome glabrous.

Type in the herbarium of W. H. Blanchard. This form has much of the habit of the sand cherry, *Prunus pumila* L. and when in flower would be taken for it at a little distance. This delicate species is not the dwarf form of *A. intermedia* Spach, which grows on the rocks near the coast, often hardly a foot high, erect and bearing fruit.

A. OLIGOCARPA (Michx.) Roem. The mountain form with few flowers has generally had but one name, though sometimes it has been called *A. sanguinea*, which name belongs to another species. It is quite variable and has been little studied. Dr. Britton has recently segregated from it

A. ARGUTA Nutt., which is perhaps more correctly *A. arguta* Britton, the name, it appears, having been given first to an herbarium specimen by Nuttall but first published in Britton's Manual, ed. 2, p. 1066, without citation of a type or any definite reference to the source of the name. The species, however is more fully described in TORREYA 5: 107. Je 1905, by Mr. Eggleston, who indicates the materials from which the original description was drawn.

The forms of the second class which have been called *sanguinea*,

spicata, *ovalis*, and *rotundifolia* may now be considered. The last two names are not available, as they were early used for the European species. There appear to be two forms of this second class in eastern North America. The first is a northern form mostly confined to Canada and the high or northern sections of the United States. It has large and nearly round leaves, generally coarsely toothed, often approaching *A. alnifolia* in that respect, has white flowers, and is often quite large or a small tree. The second form is more southern, more dwarf, with oval leaves, late, often yellow, flowers, and late-ripening fruit.

The first form seems to be the one named *Crataegus spicata* by Lamarck, which he says is supposed to have been brought from Canada. He saw the plant in cultivation. The combination *Amelanchier spicata* was first made by Koch in 1869, but he described *A. intermedia* (*A. oblongifolia*). However, as he expressly and conspicuously cites Lamarck's *Crataegus spicata*, his name must be considered as applying also to Lamarck's plant and indeed the latter may be fairly interpreted as the type of the binomial *Amelanchier spicata*. In 1874 Decaisne made the combination again and he also described *A. intermedia*. Again in 1893 Koehne made the combination in his Dendrology, but he has not described Lamarck's plant. The name is still available and cannot be dropped, so it is taken up again :

A. SPICATA (Lamarck) Koch, Dendrologie **1** : 182. 1869. (Excluding description.)

Described by Lamarck, Encyclo. **1**: 84. 1784. He says it is two or three times as high as the European species, leaves rounded, dentate, nearly as wide as long, 1.5 inches in diameter. Michaux in his Flora of North America **1**: 291. 1803, described it under the name of *Mespilus canadensis* var. *rotundifolia* : "Arboresens ; foliis suborbiculato-ovalibus, utrinque rotundatis." Habitat, "in Canada." Tracings in the Gray Herbarium of two leaves of Michaux's specimen are evidently quite different from the specimens Koehne has sent out to illustrate his book. Another name which seems to have been given to this form is *A. sanguinea* (Pursh) De Candolle, 1825, and under any rules which would preclude the use of a combination a second time

and would, in a case like *A. spicata* (Lamarck) Koch, restrict a new binomial to a plant to which an older specific name has been mistakenly transferred, *A. sanguinea* would have precedence over all others.

The second form has been known as *A. ovalis* and *A. spicata*, the former an unavailable name, and is abundant in many parts of New England and probably extends much farther west. It may be described as

Amelanchier erecta sp. nov. A slender erect shrub, 4 to 12 feet high, sparingly branched, growing in colonies and making a thick hedge. Twigs very erect, stocky. Buds very woolly when breaking, bud-scales short; bracts dark-purple, the starting leaves often yellow. Leaves very woolly on the under side when young, glabrous when fully grown, broad-oval, rounded or slightly cordate at the base, point short and broad or wanting, rather coarsely serrate-dentate or often even finely serrate; the leaves on vigorous new wood larger, often very broad, sometimes nearly orbicular. Flowers not large, often having a spread of less than an inch, often light-yellow, in close, stocky racemes, densely woolly. Fruit on erect pedicels in close erect clusters, the calyx-lobes rather short, reflexed-curled, rather small, the top of the pome densely woolly within the calyx lobes. Starts some days later than *A. canadensis* and ripens its fruit several weeks later.

Type in herbarium of W. H. Blanchard.

The fruit seems to drop badly when nearly ripe, and with the depredations of birds ripe fruit is often scarce. Abundant and typical in and around Bellows Falls, Vt., both on rocks and in dry or loamy soil.

The evidence seems to be pretty conclusive that Lamarck's *spicata* is the northern form of Michaux — his *rotundifolia*. Lamarck's description agrees well with Michaux's. He says that the plant he described grew in the Royal Garden and in private grounds and was supposed to be a native of Canada. The close connection of Canada to France until 1763 makes it almost certain that Canada was its home. There is no reason to suppose it came from a more southern region. Koehne evidently tried to include in his *spicata* both the northern and more southern forms, but his description and his specimens apply to the more southern form.

Diverging and intergrading forms are abundant in the genus. Noticeably so is it with the arboreal species, *A. canadensis*. Trees occur whose leaves are pubescent throughout the season. Leafy forms occur whose fruit branches are remarkably leafy, the fruit being entirely hidden. Birds make such onslaughts on the ripe fruit that in order to get it in quantity and perfection it is necessary to study it miles away from the inhabited sections, for birds are rare in such localities.

WESTMINSTER, VT.

SHORTER NOTES

Ribes chihuahuense sp. nov. — Branches smooth, gray. Leaves ovate to suborbicular in outline, the blades 2–2.5 cm. long, dull dark-green above, pale-green beneath, broadly cuneate to subtruncate at the base, 3-lobed, glabrous on both sides, papillose above when young, sparingly ciliate on the margin, the lobes few-toothed, acutish or obtuse, petioles as long as the blades or shorter, pubescent when young; racemes 3–5-flowered, a little longer than the leaves, the axis densely pubescent; flowers sessile or very nearly so, bracts ovate-elliptic, obtuse, ciliate, 5–7 mm. long; hypanthium nearly cylindric, 1 cm. long, sepals oblong, obtuse, 6–7 mm. long; petals ovate-oblong, acute, a little more than half as long as the sepals.

Chihuahua, Mexico, Feb., 1903, *C. A. Purpus, 1061.* Differs from all the United States species by the essentially sessile flowers.

N. L. BRITTON.

FASCIATIONS IN DROSERA, IBERVILLEA, AND CECROPIA. — The fasciated specimen of *Drosera rotundifolia* pictured herewith was found in the propagating houses of the New York Botanical Garen in March, 1907. The flattening affected the stem, resulting in a fasciated rosette, with a growing line 1.4 cm. in length. The literature of teratology seems to contain no instance of fasciation in this genus, while the odd character of the plants makes the appearance of anomalous individuals the object of peculiar interest.

Another fasciation of a curious and rare species is that of a shoot of *Ibervillea Sonorae*. One of the vine-like branches which

spring from the enormous storage tuber measures a little over a centimeter in width. In this case but a single branch is abnormal and the rest of the plant is apparently unaffected.

The fasciation of roots is comparatively infrequent, but Renaudet in a thesis dated Poitiers, 1901, states that it is found oftenest among the aërial roots of tropical species. *Cecropia palmata* produced three fasciated roots in the tropical house of the New York Botanical Garden in 1906. They emerged from the

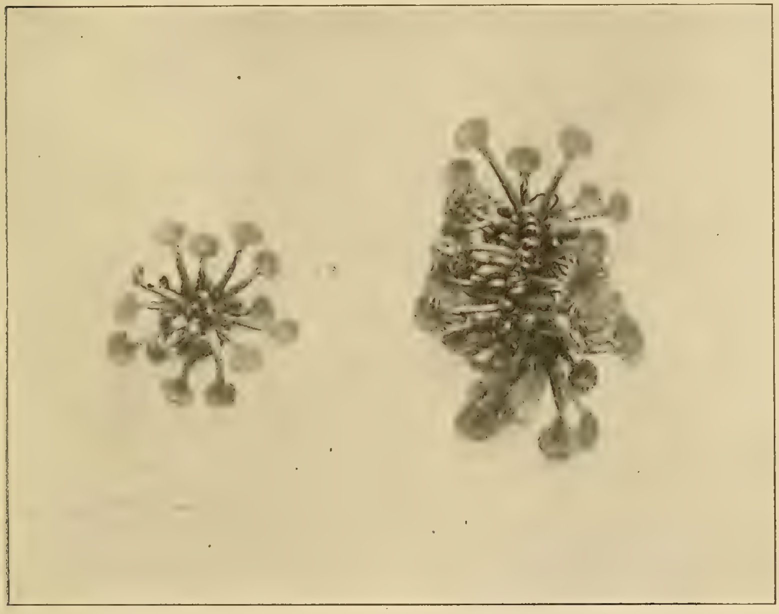

FIGURE 3. A normal and a fasciated plant of *Drosera rotundifolia*.

trunk somewhat over a foot from the ground, began to flatten close to the main axis, and were finally deeply grooved and bifurcated. The largest measured 12 mm. in width and was three-forked. They resembled closely the drawing of a root of *Pothos aurea* by Udo Dammer in Gardener's Chronicle (**26** : 724. 1886), although, perhaps owing to the early development of the fasciation, injuries such as he has described in connection with the fasciation of *Pothos* could not be detected.

ALICE ADELAIDE KNOX.

REVIEWS

Gardner's Cytological Studies in Cyanophyceae *

The many difficult questions as to the minute structure of the blue-green algae have been thoroughly reviewed and carefully studied by Dr. Gardner and his results are clearly set forth in a paper which appeared last November in the University of California Publications. His investigations have been concerned chiefly with fifty-three species representing many genera and most of the families of the Cyanophyceae. With this broad view of the field, there is naturally a better opportunity of reaching just conclusions than in the more common cytological method of studying only a few forms. Dr. Gardner found that with proper treatment everything of essential importance in the cells of these small plants may be seen without making microtome sections and finally came to use the microtome "only to supplement and check results obtained without it." The principal points as to which there has been disagreement among observers involved the existence of nucleus and chromatophores, the structure of the cytoplasm, the structure of the nucleus, if it exists, and its behavior during cell-division. Some of the more interesting results of the present investigation are summarized by Dr. Gardner as follows:

"The cell of the Cyanophyceae contains a nucleus which in some species is sharply delimited from the surrounding cytoplasm, while in others the differentiation is much less marked."

"In all the species studied, with the possible exception of *Synechocystis*, the nucleus divides amitotically, beginning at the periphery and gradually proceeding to the center."

"There is no definitely organized chromatophore, the cytoplasm holding the coloring matters."

"No protoplasmic continuity between the vegetative cells has been demonstrated."

"A new type of nuclear division has been discovered in *Dermocarpa*, in which the nucleus breaks up simultaneously into a large number of daughter nuclei by a process of amitosis."

---

* Gardner, Nathaniel Lyon. Cytological Studies in Cyanophyceae. University of California Publications. Botany **2**: 237–296. *pl. 21–26.* 10 N 1906.

"The present investigation reveals in the Cyanophyceae a series of nuclear structures beginning with a very simple form of nucleus scarcely differentiated from the surrounding cytoplasm and dividing by simple direct division. From this we pass by very gradual steps to a highly differentiated form of nucleus which in dividing shows a primitive type of mitosis, and in structure approximates the nucleus of the Chlorophyceae and the higher plants."

"In this group of plants the transmission of hereditary qualities seems to be accomplished with the greatest precision, without the complicated machinery of mitosis. In this connection it may be noted that the lack of sexuality seems in no wise to affect the amount of variation, which is quite the same as in groups where sexual reproduction occurs."

Marshall A. Howe.

PROCEEDINGS OF THE CLUB

March 27, 1907

The Club met at the museum building of the New York Botanical Garden at 3:30 P. M. Thirteen persons were present.

The death of Dr. Otto Kuntze, at San Remo, Italy, on January 28, 1907, was reported, and the resignation of Professor George Macloskie was presented and accepted.

The following scientific program was presented:

"Some Lactarii of Windham County, Vermont," by Miss Gertrude S. Burlingham:

The rugged and wooded character of Vermont makes the region especially favorable for the growth of the fleshy fungi. But the only field work in the state on this group, of which we have published results, is that of Charles C. Frost (1805–1880), who collected in the vicinity of Brattleboro. Frost was a shoemaker in Brattleboro, and is commonly reported to have begun his botanical tramps as an antidote for dyspepsia. In 1875 he coöperated with Tuckerman in a "Catalogue of plants growing without cultivation within thirty miles of Amherst College," and it is probable that most of the fungi listed were collected by Frost in Vermont.

The present collection was made during the past summer in Windham County, Vermont, immediately north of the region explored by Frost, in a belt reaching from Newfane east to Putney Mountain and west to Stratton Mountain. This part of the county varies from 180 to 600 meters in elevation, and is well wooded with balsam, spruce, hemlock, beeches, maples, and birches. In all, thirty-three species of *Lactarii* were found, of which twenty-two are not included in Frost's list. Five of these are new species, and two others are reported from the United States for the first time. Ten additional species are given in Frost's list, making for the state forty-three species, a greater number than has been reported from any other state with the exception of New York. Frost enumerated several new species, but he failed to publish any description of them, and thus unfortunately they cannot be taken into account.

Discussion followed.

"The distribution of Tree-Ferns of the Genus *Cyathea* in the West Indies," by L. M. Underwood:

The Genus *Cyathea* was originally published by Sir J. E. Smith in 1793. *Cyathea arborea*, the common lowland species of the West Indies, is the type of this genus. *Cyathea* is the type of the family Cyatheaceae containing most of the tree-ferns. There are about eleven other genera, only one, *Alsophila*, as large as *Cyathea*, which has some two hundred species about equally divided between the tropics of the Old World and the New. The 104 American species are divided about equally between North and South America. Some of the distributional features are as follows:

1. No species are common to the Old World and the New. This applies equally to all tree-ferns.

2. With two or three exceptions, no species are common to North and South America.

3. As a general rule each species is local in its distribution.

4. *Cyathea arborea*, a lowland species, is the only one common to the Lesser Antilles and all the Greater Antilles.

5. *Cyathea insignis* is common to Cuba and Jamaica (1200 meters).

6. *Cyathea pubescens* is common to Jamaica and Porto Rico. (1200–1500 meters.)

7. *Cyathea Tussacii* is common to Jamaica and Hispaniola. (1200–1500 meters.)

8. *Cyathea muricata* is common to Guadeloupe and Martinique.

9. *Cyathea tenera* is rather widely distributed from Trinidad through the Lesser Antilles.

10. Besides the above are the species endemic in single islands: Cuba, 3; Porto Rico, 1; Jamaica, 9 (three of which are still imperfectly known); Dominica, 1; St. Vincent, 1; Trinidad, 2.

11. All of the well-known endemic species of Jamaica are confined to altitudes above 1000 meters and some of them above 1500 meters.

12. The higher altitudes of Cuba and Hispaniola, whose flora is unknown, are likely to furnish additional species.

Attention was called to morphological and physiological features worthy of investigation as follows:

a. Marked structural differences in shape and arrangement of leaf-scars supposed to be due to differences of nutrition and consequent rapidity of growth.

b. The function of certain gland-like structures at the bases of the leaves in certain species and at the bases of the pinnae in others.

c. The origin of pendent lateral bud-like branches (especially in *Cyathea dissoluta*), organs of vegetative reproduction.

Discussion followed.

The meeting adjourned at 5:30 o'clock.

C. Stuart Gager,
Secretary.

April 9, 1907

The regular meeting for this date, announced on the weekly "Bulletin" to be held at the American Museum of Natural History, was postponed on account of a severe snowstorm.

C. Stuart Gager,
Secretary.

NEWS ITEMS

Miss Anna Murray Vail, librarian of the New York Botanical Garden, is in France, where she expects to spend the summer.

At the University of Chicago, Dr. Charles J. Chamberlain and Dr. Henry C. Cowles have been promoted to assistant professorships in botany.

Dr. J. W. Blankinship, recently professor of botany in the Montana College of Agriculture at Bozeman, now has a position at the Missouri Botanical Garden.

The seventh annual meeting and exhibition of the Horticultural Society of New York was held at the New York Botanical Garden on Wednesday and Thursday, May 8 and 9.

Dr. H. N. Whitford, of the Forestry Bureau of the Philippine Government, was scheduled to sail from Manila on April 15, on a leave of absence to visit the United States.

Dr. Herbert J. Webber, recently chief of the division of plant-breeding investigations of the U. S. Department of Agriculture, has begun his new duties as professor of plant biology in Cornell University.

It is stated in the April number of *The Plant World* that Mr. Carl F. Baker recently botanist of the Agricultural Experiment Station of Cuba has been elected professor of botany in Pomona College, Claremont, California.

Dr. Per Axel Rydberg, curator of the herbarium of the New York Botanical Garden, delivered an address at Augustana College, Rock Island, Illinois, on May 13, in connection with exercises commemorative of the two hundreth anniversary of the birth of Linnaeus.

Dr. Frederic E. Clements, professor of plant physiology in the University of Nebraska, was on May 2 unanimously elected professor of botany in the University of Minnesota, succeeding Conway MacMillan, who resigned this chair about a year ago in order to engage in business pursuits.

Mr. Ellsworth Bethel, instructor in biology in the East Side High School of Denver, Colorado, has installed his collection of Colorado plants, said to be probably the most complete in exist-

ence, in the rooms of the Colorado Natural History Society in the state capitol at Denver.

Dr. B. E. Fernow, chief of the forest division of the U. S. Department of Agriculture from 1886 to 1898, director of the New York State College of Forestry from 1898 to 1903, and recently professor of forestry in the Pennsylvania State College, has accepted the position of dean of the college of forestry of the University of Toronto.

Dr. E. B. Copeland, of the Bureau of Science and more recently of the Department of Education, of the Philippine Government, returned to the United States about the middle of March. Dr. Copeland has declined the offer of a botanical research position at the West Virginia University and has accepted the directorship of a newly established agricultural school in the Philippines.

Mr. Elmer D. Merrill, botanist of the Bureau of Science of the Philippines, sails from Manila for Seattle on May 15. He has a leave of absence for about nine months, and will spend some time in Washington, Cambridge, New York City, and Maine, returning later to Manila by way of Europe, where he hopes to devote three months to visiting herbaria, especially those at Kew and Berlin. Dr. Frederick W. Foxworthy will be in charge of the botanical department of the Bureau of Science during Mr. Merrill's absence.

The death of Sir Thomas Hanbury took place at his residence, La Mortola, Ventimiglia, on the Riviera, Saturday, March 9. He would have completed his 75th year on June 26, next, when it was proposed by the botanists of his acquaintance to give the day special notice. Sir Thomas was well known as founder of the Hanbury Botanical Institute of the University of Genoa and for the great garden of arid plants and succulents at La Mortola, where he welcomed the botanists of the world with true cordiality. — W. L. Jepson.

Pehr Olsson-Seffer, Ph. D. (Stanford, '04), recently director of La Zacualpa Botanical Station, Escuintla, Chiapas, Mexico, and since last September commissioner of tropical agriculture for the Mexican Government, returned to New York on May 6, from

an eight months' tour around the world. Dr. Olsson-Seffer's headquarters will now be in the City of Mexico, where he expects to arrive by June 1, stopping a few days in California *en route*. He intends soon to present a report to the Mexican Government on the condition of agriculture in other countries. Dr. Olsson-Seffer is editor-in-chief of a series of "Practical Handbooks on Tropical Agriculture," consisting of over thirty volumes, soon to be published by the Macmillan Company.

The press dispatches announce the death, on April 22, of Dr. Frans Reinhold Kjellman, professor of botany in the University of Upsala. Professor Kjellman was born November 4, 1846. He was officially connected with the University of Upsala from the year of his doctorate, 1872, to the time of his death, succeeding finally to the chair of botany once occupied by the distinguished Linnaeus. Between 1872 and 1880, he accompanied Nordenskiöld on three voyages to Spitzbergen, Nova Zembla, and the northern coast of Siberia, and after his return published several important papers on the flora of the regions visited, dealing especially with the marine algae and the phanerogams. Kjellman's elaboration of the Phaeophyceae for Engler and Prantl's Die natürlichen Pflanzenfamilien is perhaps the best known of his more recent publications.

The program of the course of Saturday afternoon lectures at the New York Botanical Garden for the spring of 1907 is as follows: April 27, "The Life Story of a Tree," by Dr. C. Stuart Gager; May 4, "The Flowers of Trees and Shrubs Growing Wild near New York City," by Dr. N. L. Britton; May 11, "Jamaica: Its Flora, Scenery, and Recent Disaster," by Dr. M. A. Howe; May 18, "Water Lilies and other Aquatic Plants: their Relation to Horticulture," by Mr. G. V. Nash; May 25, "The Influence of Vegetation in the Formation of Recent and Ancient Swamps," by Dr. Arthur Hollick; June 1, "Some Little Known Edible Fruits of the United States," by Dr. H. H. Rusby. The lectures are given in the museum building of the Garden, beginning at 4 P. M. They are illustrated by lantern-slides and otherwise.

The program of the commemoration of the two hundredth

anniversary of the birth of Linnaeus, on May 23, under the direction of the New York Academy of Sciences, includes, as previously announced in TORREYA, exercises in the forenoon at the American Museum of Natural History, in the afternoon in Bronx Park, and in the evening at the New York Aquarium and at the Museum of the Brooklyn Institute. The features of chief botanical interest will be the following: In the museum building of the New York Botanical Garden, from 2 to 3:45 P. M., there will be an exhibition of American plants known to Linnaeus, in charge of Professor L. M. Underwood, Dr. John K. Small, Dr. P. A. Rydberg, Dr. Marshall A. Howe, and Mr. G. V. Nash, and also an exhibition of the botanical writings and of portraits of Linnaeus, in charge of Dr. C. B. Robinson and Dr. John Hendley Barnhart. At 2:45 P. M., Dr. Per Axel Rydberg will deliver an address on "Linnaeus and American Botany" and an hour later Dr. H. H. Rusby will exhibit selected lantern-slides of North American flowers known to Linnaeus. From 3:45 to 4:30 P. M., such visitors as desire will walk or drive through the grounds of the Garden under the guidance of Dr. W. A. Murrill, who will point out characteristic American trees of species with which Linnaeus was acquainted. A bronze tablet commemorative of Linnaeus, a gift to the city from the New York Academy of Sciences, will be unveiled at 4:30 P. M. at the bridge, thereafter to be known as the Linnaean Bridge, over the Bronx River in Pelham Parkway, in that part of Bronx Park lying between the Botanical Garden and the Zoölogical Park. At the unveiling exercises an address will be made by Dr. N. L. Britton, president of the New York Academy of Sciences. The American Union of Swedish Singers will furnish musical numbers. At the Museum of the Brooklyn Institute, at 8 P. M., there will be an address by Mr. E. L. Morris on "The Life of Linnaeus" and by Mr. F. A. Lucas on "Linnaeus and American Natural History," and an exhibition of lantern-slides of "Plants and Animals Known to Linnaeus by Dr. A. J. Grout and Mr. F. A. Lucas." In connection with the Brooklyn exercises, songs will be rendered by the Glee Club of the United Swedish Societies.

The third regular meeting of the Botanists of the Central

States was held at Madison, Wisconsin, March 28–30, 1907. Professor F. C. Newcombe of the University of Michigan, the retiring president, read an address entitled "A Need in Botanical Science in America." Professor T. H. Macbride of the University of Iowa was elected president for the ensuing year.

The eighteenth season of the biological laboratory of the Brooklyn Institute of Arts and Sciences at Cold Spring Harbor, Long Island, will begin on July 3 and will continue six weeks. The courses in cryptogamic botany will be in charge of Professor D. S. Johnson of Johns Hopkins University and Mr. H. H. York of the University of Texas. Courses in plant ecology will be given by Dr. E. N. Transeau of the Carnegie Institution of Washington and Mr. W. S. Cooper of Johns Hopkins University.

OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

---

(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 33, published in 1906, contained 635 pages of text and 26 full-page plates. Price $3.00 per annum. For Europe, 14 shillings. Dulau & Co., 37 Soho Square, London, are agents for England.

Of former volumes, only 24–33 can be supplied entire; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Vols. 24–27 are furnished at the published price of two dollars each; Vols. 28–33, three dollars each.

Single copies (30 cts.) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–11 and 13 are now completed and Nos. 1 and 2 of Vol. 12 have been issued. The subscription price is fixed at $3.00 per volume in advance. The numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **The Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

THE TORREY BOTANICAL CLUB
Columbia University
NEW YORK CITY

Vol. 7 June, 1907 No. 6

TORREYA

A Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE AND PHILIP DOWELL

JOHN TORREY, 1796–1873

CONTENTS

Published for the Club
At 41 North Queen Street, Lancaster, Pa.
by The New Era Printing Company

[Entered at the Post Office at Lancaster, Pa., as second-class matter.]

THE TORREY BOTANICAL CLUB

TORREYA is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, fifteen cents. To subscribers elsewhere, five shillings, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to TREASURER, TORREY BOTANICAL CLUB, 41 North Queen St., Lancaster, Pa., or Columbia University, New York City.

Matter for publication should be addressed to

MARSHALL A. HOWE
New York Botanical Garden
Bronx Park, New York City

Vol. 7. No. 6.

TORREYA

June, 1907

NOTES ON POLYEMBRYONY

By Melville T. Cook

Polyembryony has been reported as occurring in a large number of species. Braun * in 1860 reported polyembryony as known in twenty-one species, in thirteen genera, and in twelve families. Since that time it has been reported in a number of other species. The causes of this phenomenon are not thoroughly understood and are not always the same. Coulter and Chamberlain † give six different methods by which two or more embryos may be produced in a single seed and three forms of pseudo-polyembryony as follows:

True Polyembryony

A. Embryos derived from cells outside the sac, hence sporophytic tissue (vegetative multiplication or budding).

1. Embryos derived from cells of the nucellus.
2. Embryos derived from cells of the integument.

B. Embryos derived from cells within the sac (parthenogenesis and vegetative apogamy); although not in the same morphological category, embryos from the suspensor are also included in the list (vegetative multiplication or budding).

1. Normal occurrence of two eggs.
2. Embryos from synergids.
3. Splitting of embryos derived from egg.
4. Embryos from antipodal cells.
5. Embryos from endosperm cells.
6. Embryos from the suspensor.

* Braun, A. Ueber Polyembryonie und Keimung von Caelebogyne, ein Nachtrag zu der Abhandlung über Parthenogenesis bei Pflanzen. Abhandl. Kongl. Akad Wiss. Berlin 1859: 109–263. 1860.

† Coulter and Chamberlain. Morphology of Angiosperms. 1903.

[No. 5. Vol. 7, of Torreya, comprising pages 89–112, was issued May 20, 1907.

PSEUDO-POLYEMBRYONY

1. Ovules grown together.

2. Division of nucellus.

3. Development of several embryo-sacs in the same nucellus.

Probably the oldest record we have is that of Leeuwenhoek, who found polyembryony in orange seeds in 1719. It is very conspicuous in this genus and has been frequently mentioned in the literature. Although the number of seedlings from a single seed is usually only two or three, it may exceed that number and as many as thirteen seedlings from a single seed have been reported. Strasburger * has made a careful study of polyembryony in a number of species and has found that in the orange (*Citrus Aurantium*) all the embryos except those that developed from the fecundated eggs were produced by cells of the nucellus and to such he gave the name "adventive" embryos. That is to say, these adventive embryos were from the sporophytic tissue of the mother plant, were produced by vegetative multiplication or budding, and therefore derived their character from a single parent. This fact presented a very complicated problem in plant breeding, since in hybridization only those embryos which were produced by the fecundated eggs could possess characters derived from double parentage. This was proved by Webber and Swingle (†, ‡), who collected data for their work on a very large number of *Citrus* seedlings. They called attention also to the facts that the problem was doubly complicated because the hybrids frequently resemble the female parent and because the parents are frequently so similar in appearance that it is impossible to tell whether the seedlings are from hybrids or adventive embryos. However, they also state that the hybrid seedling is almost invariably more vigorous than the seedlings from adventive embryos, a fact which undoubtedly facilitates the work of the plant-breeder to some extent.

* Strasburger, E. Ueber Polyembryonie. Jenaisch. Zeitsch. Naturwiss. **12**: 647–670. 1878.

† Webber, H. J. Complications in Citrus Hybridizations caused by Polyembryony. Science II. **11**: 308. 23 F 1900.

‡ Webber, H. J., & Swingle, W. T. Yearbook of the Department of Agriculture, 1904: 226, 227.

The writer has recently made some observations upon the seedlings of *Mangifera indica* and *Eugenia Jambos*, both of which

FIGURE 1. Germinating seeds of the mango (*Mangifera indica*). One of the seeds is producing eight seedlings.

are tropical trees. In the germination of the seeds both of these species are strikingly similar to the orange. The mango (*M. in-*

dica) also was studied by Strasburger * who reported that it also produced adventive embryos. The writer's observations confirm this view. The seed splits first at the large end and then gradually down the edges. From this opening the seedlings grow, usually more than one and frequently as many as eight. In most cases one seedling is considerably in advance of the others. An examination of the seed about the time of germination shows that the nucellus is broken up into irregular pieces of variable

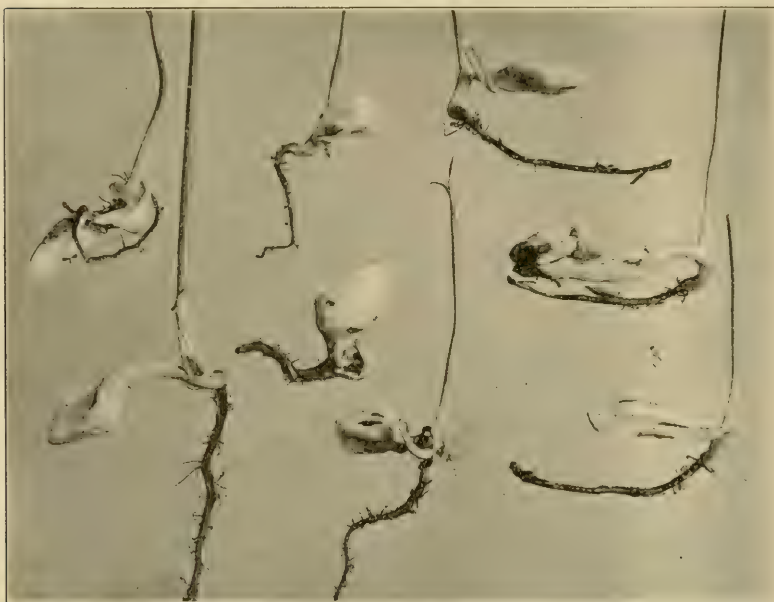

FIGURE 2. Eight seedlings of the mango (*Mangifera indica*) from the single seed, showing the blocks of nucellus, each producing a seedling.

sizes and that each piece produces a seedling. The writer observed this same tendency for the nucellus to break into pieces in the *Citrus* fruits also but does not know that each of these pieces produces a seedling. The surfaces of these pieces are smooth and apparently along well-defined cleavage planes. The writer is unable to say whether the strongest embryo is from the fertilized egg or not.

* Loc. cit.

Polyembryony was also very common in the rose-apple (*Eugenia Jambos*) but usually the number of seedlings did not exceed three from a single seed. Examination of the mature seeds showed that they also were separated into pieces as in the case of the orange and the mango. However, there were usually two or three, rarely more large pieces and a number of very small pieces. The seedlings were produced from the large pieces. Apparently this is another case of adventive seedlings, the same as found in the orange and the mango.

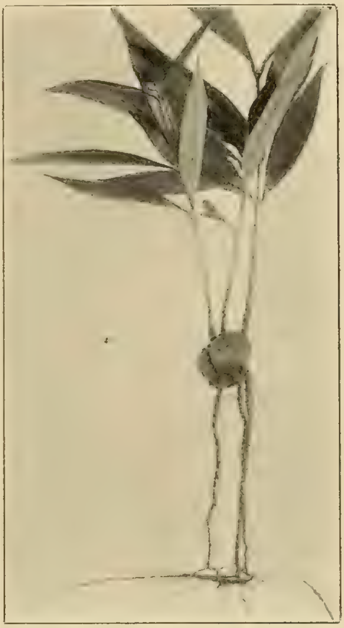

FIGURE 3. Three seedlings of *Eugenia Jambos* from a single seed.

The writer made an attempt to study the embryology of these species but the material was unsatisfactory and he did not have another opportunity to collect material before leaving Cuba.

The mango is recognized as a very important fruit in the tropics and also as one which presents great commercial possibilities. But before it can be of very great value it must be the subject of careful study and experimental work by the plant-breeder and the horticulturist, and then this tendency to polyembryony will present a much more complicated problem than in the case of the orange, since on account of the character of the foliage it will be much more difficult to determine which of the embryos are true hybrids.

Delaware Agricultural Experiment Station,
Newark, Delaware.

SUGGESTIONS FOR THE STUDY OF THE LACTARIAE *

By Gertrude Simmons Burlingham

There are only a few species of *Lactaria* which can be identified positively from dried specimens in the absence of field-notes. Furthermore, one who is not more or less familiar with the distinguishing characteristics of the species in this genus may make seemingly ample notes and yet omit some of the vital points, with the result that much otherwise valuable material becomes worthless or even misleading. Any such waste of time and material is especially lamentable in view of the fact that only a few scattered regions in the United States have been explored at all for any genus of the fleshy fungi. Approximately ninety species and varieties of *Lactaria* have been reported from the United States, fifty † of which have been described as new species ; but of this number only five have been described from states west of the Alleghany Mountains, while from the majority of the states west of this line no species whatever have been reported. An economic as well as a scientific interest attaches to the genus, since *Lactaria deliciosa* and *Lactaria volema* are among the choicest of the esculent mushrooms, and several other species are considered nearly as palatable.

The generic characters are conspicuous. The exudation from cuts and bruises in the flesh or gills, of a white or colored juice having the consistency of milk, is usually sufficient to mark the specimen as a *Lactaria.* In common with the *Russulae,* the *Lactariae* have a vesiculose structure which gives the flesh of both the stem and the pileus a cellular appearance much like pith, and in consequence of this structure the flesh is readily broken and is never fibrous or tough, and the stem is never cartilaginous. The genus is characterized also by the occurrence

---

* In Tent. Disp. Meth. Fung. 1797, Persoon uses the term *Lactaria* as a generic name, thus antedating the *Lactarius* of Fries by nearly half a century. At the time of publication of "Some Lactarii from Windham County, Vermont," I was unable to obtain this book for consultation.

† It is possible that some of these may prove not to be good species.

in many species of concentric bands of deeper color on the surface of the pileus, producing what is termed a zonate pileus. The *Lactariae* are found chiefly in woods or on the border of woods, and they vary in size from species with the pileus less than 2 cm. broad to species having a pileus 15 cm. or more across.

Milk. — The first field-note to be made is regarding the color of the milk and whether the color changes upon contact with the air. Sometimes when the milk is at first white and then changes to some shade of yellow, the change comes so rapidly that careful observation is necessary to detect that the milk is white at first. This is true in *Lactaria resima*. Again a change may not be noticeable for several minutes. A collector should always be positive as to whether or not the color of the milk does change upon exposure to the air. It may be that wounds will be discolored, while the milk remains white, as in the case of *Lactaria volema*, in which the gills and flesh become brownish where injured. *Lactaria fuliginosa* has white milk which according to European mycologists changes to salmon. In the American species the gills and cut flesh show the change very decidedly but a drop of the milk remains white except where in contact with the flesh. In order to distinguish between such changes, it is necessary to watch a large drop of milk until satisfied as to the truth. It is always well to state in the field-notes "milk white, unchanging" or "milk white, changing" in order to indicate that such careful observation has been made.

It is also necessary to know the taste of the milk. This may be mild, that is with no decided taste, or sweetish, or the milk may be mild at first and in fifteen seconds or more become peppery on the tongue; sometimes it is bitter and astringent, and again it may be extremely acrid from the first as in *Lactaria piperata*. Since the taste differs sometimes in young and old specimens, it is best to taste more than one. None of the *Lactariae* so far as is known are extremely poisonous, and there will be no danger in tasting the milk, but it will be advisable not to swallow the juice.

Pileus. — One of the distinguishing points of a species is the

color of the pileus. Not only is this a variable character, but two collectors may describe the same color in different terms. Much difficulty can be avoided if a collector uses some standard color scheme, as Saccardo's *Chromotaxia*. Perhaps the most complete and satisfactory color chart is *Répertoire de Couleurs* published by the French Society of "Chrysanthémistes," which gives 365 distinct colors in various tones, including the reproduction of the colors recognized by Saccardo. The color description should be made as soon as possible after collection and should include the color of young, mature, and old specimens. If the pileus is zonate, the zonation should be described carefully.

It is also necessary to note the character of the surface of the pileus. In some species the pileus is never viscid, in others viscid only in wet weather, and in still other forms, the viscidity is more or less persistent. When *Lactariae* are collected in dry weather, special means must be used to determine positively whether the pileus is viscid when wet. This may be determined by standing the mushrooms in water for a short time or by placing them in the grass where they will be covered with dew during the night. As a rule the other surface characters will be preserved in drying, but sometimes these may be fugacious. For example, the pileus of young plants may have a tomentose covering in whole or in part, which will disappear in the mature specimens. The extreme edge of the pileus is often minutely tomentose at first and later glabrous. On the other hand, the pileus may be glabrous at first and later squamulose or rimulose. Any such peculiarities should be mentioned in the field-notes.

Gills. — The color of the gills should be observed both in young and mature plants, and note made whether the color changes with age, or where the gills are wounded. Although the arrangement of the gills can be told from the dried specimen, it can be determined more readily from the fresh mushroom. This is especially true in cases where the gills branch. A drawing showing the number of gill series, the branching and the closeness is better than a description. The color of the spores differs in the species, so that a rough spore-print ought to be made in order to see the color in mass.

STEM.—The important points in connection with the stem are the color, shape, character of the surface, and the texture of the flesh, that is, is the stem pithy at first, then hollow, or is it firm even in old age?

HABITAT.—The character of the habitat is of special consequence; whether pasture, woods, open groves, or swamp; the kind of trees predominating in the immediate vicinity, and the species under which the fungi were growing; the kind of soil and the moisture content; the locality and the elevation. Also, is the species solitary or gregarious in habit, and what size do the mushrooms attain?

COLLECTING AND PRESERVING.—Of course it is of primary importance that the different specimens or "numbers" gathered should be kept distinct. This is easily accomplished by carrying in the collecting basket a supply of various sized paper sacks, and a species may then be placed in a bag with the accompanying field-notes. Like care must be used during the process of drying the mushrooms; for the mushrooms must be dried and preserved, since the descriptions are as useless without the dried specimens as are the latter without field-notes. The *Lactariae* may be dried successfully by spreading them on a wire screen which may be put under the kitchen stove or suspended about three feet above it. Oven heat is liable to be too great for the best results. When possible, three or four typical specimens of a species should be preserved, representing both young and mature condition. When dry, the mushrooms, together with the field-notes, may be transferred to paper sacks again, or to suitable boxes, and filed away for future study and identification. If some time is to elapse before this study is to be undertaken, something like naphthaline flake ought to be put in the boxes to protect the mushrooms from the attacks of the larvae of moths and carpet beetles.

The following outline contains the essential points for field-notes and at the same time a minimum amount of information necessary for the determination of species. Of course, it is evident that drawings or water-color sketches will be a valuable addition to the notes. The appended bibliography will form a working basis for the identification of the *Lactariae*.

Locality.. ....Date..................................
Habitat.. ....
Milk
    color................. ....change........ ....taste............
Pileus
    color, zonate or azonate.... ....
    surface, dry or viscid ....
        glabrous or pruinose, squamulose, pubescent, tomentose
        ....
    margin, glabrous, pruinose, downy, tomentose,......................
        even or striate.. ....
Stem
    color ....shape.............. ....
    surface, dry or viscid................... ....
        glabrous, etc.. ....
    substance, solid, or lax, becoming hollow...............................
Gills
    color...... ...does the color change with age ....
        where bruised...... ....
    number, distant or close............... ....
    arrangement, entire or branched, number of series ....:..
Spores
    color in mass........ ....
Flesh
    color, does it change where broken.....................................
    odor...
Size of plants.. ....
Solitary or gregarious... ....

Bibliography

Atkinson, G. F. Mushrooms, Edible, Poisonous, etc., 114–125. 1900.

Berkeley, M. J. Centuries of North American Fungi. Annals and Magazine of Nat. Hist. III. **4**: 10. 1859. Describes two new species.

Burlingham, G. S. Some *Lactarii* from Windham County, Vermont. Bull. Torrey Club **34**: 85–95. 1907. Describes five new species.

Clements, F. E. Botanical Survey of Nebraska **1894–95**: 20. 1896. Describes one new species.

Earle, F. S. Key to the North American Species of *Lactarius*. Torreya **2**: 139–141, 152–154. 1902.

Herbst, W. Fungal Flora of the Lehigh Valley, Pa. 101–106. 1899.

Johnson, A. E. Bull. Minn. Acad. **1877**: 337. 1878. Describes one new species.

Longyear, B. O. New Species of Michigan Fungi. Rep. Mich. Acad. of Sci. **1901**: 57–59. 1902. Describes two new species.

Morgan, A. P. The Mycologic Flora of the Miami Valley, Ohio. Jour. Cinn. Soc. Nat. Hist. **6**: 182–185. 1883.

Murrill, W. A. Terms Applied to the Surface and Surface Appendages of Fungi. Torreya **5**: 61–66. 1905.

McIlvaine, C., & MacAdam, R. K. One Thousand American Fungi. 161–184. 1902.

Peck, C. H. Rep. N. Y. State Bot. **1884**: 111–133. 1885; **1887**: 74. 1888; **1889**: 19, 20. 1890; **1890**: 71, 72. 1891; **1901**: 949. 1902; **1902**: 43–45. 1903; **1903**: 18, 19. 1904; **1904**: 33. 1905; **1905**: 37. 1906. Bull. Torrey Club **25**: 369. 1898; **32**: 78. 1901. Describes thirty-two new species and four new varieties.

Saccardo, P. A. Sylloge Fungorum **5**: 423–453. 1887; **9**: 56–58. 1891; **11**: 31, 32. 1895; **14**: 94, 95. 1899; **16**: 43–46. 1902; **17**: 29, 30. 1905.

New York Botanical Garden.

ADDITIONS TO THE TREE FLORA OF THE UNITED STATES

By J. K. Small

In a previous paper* I recorded the discovery of six trees new to the flora of the United States. Four of the species there mentioned, namely *Quercus Rolfsii* Small, *Ilex Krugiana* Loesener, *Rhus leucantha* Jacq., and *Tetrazygia bicolor* (Mill.) Cogn., are indigenous to Florida, while two species, *Mangifera indica* L., and *Sapota Zapotilla* (Jacq.) Coville (*Achras Sapota* L.) are naturalized plants.

Further exploration in South Florida has revealed six additional arboreous plants, which are as follows:

Serenoa serrulata (Michx.) Hook. As far as we are aware, throughout the range of this species in North Carolina, South Carolina, Georgia, and northern Florida, the stem never rises above the surface of the ground. In South Florida, under quite similar conditions, the stem not uncommonly stands erect or

* Additions to the Flora of Subtropical Florida. Bull. N. Y. Bot. Gard. **3**: 419–440. 1905.

nearly so, although more commonly it is horizontal as in the case of the plants growing further north. On the dunes back of the beach opposite Miami, plants with erect stems ten to twelve feet tall are quite common. There is a small grove in the pinelands north of Arch Creek on the mainland seven or eight miles north of Miami, consisting of taller plants, the stems of some measuring twenty-six feet in height. The upright plants have no floral characters to separate them from the horizontal-stemmed ones, but the foliage is usually more glaucous. I have not yet been able to discover the reason for the plants assuming the two distinct habits, for both the erect and horizontal-stemmed forms occur in close proximity, growing both in deep sand or on almost bare coral rock.

Chrysobalanus pellocarpus Mey. This species as it occurs in Florida is strongly contrasted with *Chrysobalanus Icaco* L. The plants of the latter species are mainly confined to the sand dunes near the beach and the contiguous regions. In the everglades it is apparently replaced by *Chrysobalanus pellocarpus* Mey. This species differs from *C. Icaco* in its smaller, narrower, usually abruptly pointed or rounded leaf-blades, the smaller flowers with typically spatulate petals, and the obovoid or oblong-obovoid drupes with narrow sharp-ridged stones.

Alvaradoa amorphoides Liebm. The discovery of this tropical plant in Florida has already been recorded * but hitherto it was known within our limits only as a shrub. In the hammocks near the trail that crosses Long Prairie a few miles northeast of Camp Longview small trees varying between twenty and thirty feet in height are not uncommon. It attains about the same development as *Tetrazygia bicolor*, with which it grows.

Suriana maritima L. The greatest height to which this seashore plant was formerly known to attain seems to have been about six feet. I have seen it growing at many places on the coast of South Florida and with the exception of the instance to be mentioned the specimens were invariably less than six feet tall. However, in the fall of 1904, I discovered it growing as a tree on the western shore of Elliott's Key at a point about twenty-

* Bull. N. Y. Bot. Gard. 3: 424. 1895.

five miles south of Miami. There the plants grew along the shore for a distance of about one hundred feet, the larger ones attaining a height of about thirty feet with a maximum trunk-diameter of fully one foot.

SOLANUM VERBASCIFOLIUM L. This species of *Solanum* occurs as a tree both on the mainland of southern peninsular Florida and on the Keys. In the hammocks throughout the homestead country southwest of Cutler, plants of this species are not uncommon and they sometimes grow to a height of between twenty-five and thirty feet with a trunk-diameter varying from six to eight inches. On the Keys, for example on the western side of Elliott's Key, the plants reach about the same proportions, assuming however a somewhat more stocky habit, being not quite so tall but with a greater trunk-diameter.

GENIPA CLUSIIFOLIA (Jacq.) Griseb. In the hammocks near the coast the plants of this species are usually irregularly branched shrubs. On the dunes along the seashore they commonly occur as diminutive trees varying from two to six feet in height. Their habit there resembles that assumed by *Terminalia Catappa*, that is, with the branches whorled in several tiers. In a hammock on the dune several miles south of Fort Lauderdale I have found many plants as fully developed trees, some of the trunks measuring over one foot in diameter.

NEW YORK BOTANICAL GARDEN.

SHORTER NOTES

A NEW SPRUCE FROM THE CANADIAN ROCKY MOUNTAINS. — In a landscape in the Canadian Rocky Mountains in Alberta or British Columbia, probably the most striking feature is the slender spruces, which at the lower altitudes in the wet grounds and river bottoms are frequently found growing to the exclusion of all other trees. The species has been referred by authors to both *Picea canadensis* (Mill.) B. S. P. and *P. Mariana* (Mill.) B. S. P., to both of which it bears a certain resemblance, but from two months' experience with the tree during the past season, in the region from Banff, Alberta, to Field, B. C., I am satisfied that it is quite distinct from either, and therefore propose for it the following name:

Picea albertiana sp. nov. — A slender tree, attaining a height of over 15 m. Twigs and sterigmata smooth and shining or occasionally slightly glandular but never glaucous, yellowish-brown when young becoming darker with age; sterigmata strongly reflexed and standing out frequently more than 1 mm. from the twigs: leaves pale-blue or blue-green, surrounding the stem and crowded toward the upper side, at the ends of the branches, 1.5 cm. to 2.5 cm. long, 4-sided, with 3, 4, or sometimes 5 rows of stomata on each side, incurved, acute or acuminate with a rigid tip: cones ovate, bright-crimson when young, at maturity 2.5 cm. to 3.5 cm. long and nearly as broad when expanded, early deciduous; scales stiff and rigid, broadly rounded at the apex, entire, broader than long, cinnamon-brown with a chestnut edging and shading to darker chestnut toward the base; bract 2 mm. or less long, 1 mm. broad, with a sharply angular, more or less acute erose tip.

Type *no. 796, S. Brown*, Bankhead, Alberta.

The common spruce of the lower altitudes through the Canadian Rockies in Alberta and British Columbia, differing from *P. canadensis* (Mill.) B. S. P. in the longer, strongly reflexed sterigmata, shorter, broader and darker colored cones, with broadly rounded scales and minute sharply angled bracts, and from *P. Mariana* (Mill.) B. S. P. in the lighter colored, smooth twigs with longer sterigmata, and light-blue or blue-green leaves, and cones with broader, entire scales with angular-tipped bracts.

STEWARDSON BROWN.

ACADEMY OF NATURAL SCIENCES,
PHILADELPHIA.

PROCEEDINGS OF THE CLUB

APRIL 24, 1907

The meeting was called to order at the museum building of the New York Botanical Garden, at 3:40 P. M. with Dr. M. A. Howe in the chair. Twenty persons were present.

The minutes of the meeting of March 27, 1907, were read and approved, and also a note recording the postponement of the stated meeting of April 9th, 1907.

Mr. Edward B. Chamberlain, 38 West 59th St., N. Y. City, was nominated for membership.

The resignation of Mrs. H. A. DeCoster, dated March 25,

1907, was read, and the death of J. Schneck, M.D. was reported. On motion the resignation of Mrs. DeCoster was accepted.

A communication to Dr. N. L. Britton, from Professor L. R. Jones was read, containing an invitation to the Torrey Club from the Vermont Botanical Club, to join the latter in its annual field meeting at Pownal, July 1 to 3. Dr. Britton had already replied to the invitation and it was received and ordered to be placed on file.

An invitation was read from the New York Academy of Sciences inviting the Torrey Botanical Club to participate in the celebration of the two hundredth anniversary of the birth of Carl von Linné, on May 23, by sending an authorized representative, and by presenting an official document, commemorative of the life and work of Linné, to be read at the exercises.

It was unanimously voted that Dr. Rusby, the president of the Club, act as the authorized representative of the Club at the coming celebration, and, on vote, the chairman of the meeting was authorized to appoint a committee, with power, to arrange for the preparation of the commemorative document to be read at the anniversary exercises. The following committee was appointed: Dr. W. A. Murrill, Mrs. E. G. Britton, Dr. Tracy E. Hazen.

The program committee was, on vote of the Club, authorized to arrange, if possible, to hold the next meeting of the Club at Teachers College, Columbia University.

By unanimous consent the secretary cast the vote of the Club electing Mr. Chamberlain to membership.

The following scientific program was presented:

"Ecological Distribution of the Beach and Dune Flora about Chicago, Ill.," by Miss Mary Perle Anderson.

Miss Anderson gave a brief account of the geological history of the ancient Lake Chicago and its succession of beaches, the Glenwood, the Calumet, and the Toleston. These ancient beaches were formed by changes in the lake-level and at the present time are indicated by ridges of wooded land more or less parallel to the present coastal beach of Lake Michigan. The ridges are separated by the low level prairie land which makes up the Chicago plain.

The formation of the dunes along the present shore of the head of Lake Michigan was considered, and also the changes in the flora that may be noted as one passes from the naked shifting dunes and extremely xerophytic conditions of those recently fixed, to the dunes farthest inland, where mesophytic conditions prevail. Certain grasses, species of *Calamagrostis*, *Andropogon*, *Ammophila*, and *Elymus*, do much to bind the dunes. The first trees to appear are the cottonwood and certain willows, which are also of value in fixing the dunes. The scrub-oak and black oak soon appear and are followed by the bur-oak, the white oak, and the red oak. *Pinus Banksiana* is followed by the white pine; the pig-nut hickory is succeeded by the shag-bark; other trees, such as the basswood, ash, cherry, and black walnut, come in, and on the most mesophytic slopes of the oldest dunes and beaches one finds the sugar-maple and, more rarely, the beech, hemlock, and southern tulip-tree. Corresponding changes in the shrubby and herbaceous vegetation occur, and at Stevensville and Porter, one may pass in a short time, from extreme desert conditions through successive stages of the open forest of low trees and shrubs to the oak-hickory type and finally to the beech-maple-hemlock combination, which indicates the culmination of the forest in this region.

The usual ecological factors, heat, light, water, soil, wind, and direction of slope, all have their influence on the floral distribution. Conditions in the dunes are extreme. Thus, for example, the trailing-arbutus and the bearberry, both northern types, may appear on the north-facing slope of a dune, while just over the crest, on the south-facing slope, the cactus may flourish.

Emphasis was laid on the fact that species vary with environment, often losing more or less of their xerophytic adaptations under mesophytic conditions; that a plant-society is only a stage in the development of a region; that the apparent tendency is for all to approach the mesophytic condition.

The paper was discussed by Dr. Grout and Dr. Rydberg.

"Some Relations between Habitat and Structure in Mosses," by Dr. A. J. Grout.

Xerophytic mosses apparently tend to develop short, thick-

walled leaf-cells, often with papillae over the lumen. Nearly all mosses with papillae over the lumen of the cell are xerophytic, or belong in groups that are largely xerophytic. Presumably the papillae tend to retard transpiration.

Pleurocarpous mosses growing on trees tend to develop short thick-walled cells, especially at the basal angles of the leaves, and a similarity of leaf-structure in the tree-growing mosses due to this fact has produced much of the confusion and uncertainty in classifying such mosses, *e. g.*, *Alsia*, *Dendroalsia*, *Bestia*, *Groutia*, and their relatives.

Tree-growing mosses also tend to develop erect capsules, and the correlated imperfect peristomes. To some extent this seems to apply to other xerophytic mosses.

Aquatic or subaquatic pleurocarpous mosses have an apparent tendency to develop enlarged and inflated alar cells.

Cleistocarpous and gymnostomous mosses appear, for the most part, to be mosses of various relationships adapted to damp soil, not closely covered with other vegetation, and best suited to support a rather short-lived annual moss.

The speaker recognized numerous exceptions to the above relationships, if stated as general principles, but, stated as tendencies, he believes they are worthy of serious consideration by the systematist, the morphologist, and the ecologist.

A brief discussion followed.

The Club adjourned at 5:20 P. M.

C. STUART GAGER,
Secretary.

MAY 14, 1907

The meeting was called to order at the American Museum of Natural History with President Rusby in the chair. One hundred and four persons were present.

The reading and approval of the minutes for April 24 was followed by the presentation of the names of the following persons for membership :

Mr. Theodore Gottschalk, 2311 Second Ave., N. Y. City; Mr. W. H. Liebelsperger, Fleetwood, N. J.

The committee appointed at the preceding meeting to arrange

for the preparation of the commemorative document to be read at the celebration, by the New York Academy of Sciences, of the two hundredth anniversary of the birth of Carl von Linné, reported, through the secretary, that Professor Underwood had been appointed to prepare the document, and had accepted.

On motion the secretary cast the ballot of the club, electing to membership the persons nominated.

The scientific program consisted of a symposium of four papers on the subject of "Trees." Each paper was illustrated by lantern views. The symposium was opened by Professor L. M. Underwood, who spoke on "Some Historic American Trees." Mr. William Solotaroff discussed "The Planting and Care of Shade Trees," giving an interesting account of the preparation for planting in the nursery, methods of transplanting along highways and streets, the dangers that threaten shade trees, and briefly of the means of protection against these dangers.

Dr. E. B. Southwick spoke on "Trees in Winter," showing views taken in Central Park, and elsewhere in and about Greater New York. The last number was by Dr. N. L. Britton, who showed a selection of colored lantern slides from the Van Brunt collection, illustrating the flowers and fruits of common trees.

At the conclusion of the regular program, Mr. Edward R. Taylor, of Penn Yan, N. Y., exhibited some beautiful, and botanically interesting, samples of vegetable silk, and fabrics woven from it, together with the raw material of which it is made. The process of its manufacture from cotton-seed cellulose was briefly described, and samples of "artificial horse-hair," made by treating ordinary cotton thread with the dissolved cotton-seed cellulose, were also exhibited and the process of its fabrication briefly described.

The Club adjourned at 10:30 o'clock.

C. Stuart Gager,
Secretary.

NEWS ITEMS

Dr. J. E. Kirkwood has recently been promoted to a professorship of botany in Syracuse University, and the botanical work there is now recognized as an independent department of the university instruction.

Mr. Guy West Wilson (M. S., Purdue University, 1906), who during the past year has been engaged in mycological studies at the New York Botanical Garden, has been appointed professor of biology in the Upper Iowa University at Fayette, Iowa, and expects to begin his work there next autumn.

Fred Jay Seaver, university fellow in botany in Columbia University during 1906–'07, has been appointed assistant professor of botany in the North Dakota Agricultural College and assistant botanist of the agricultural experiment station at Fargo, North Dakota.

Mr. Edward Lyman Morris, who has been connected with the high schools of Washington, D. C. since 1895, and since 1900 head of their biological departments, has been appointed curator of natural sciences in the Museum of the Brooklyn Institute of Arts and Sciences, the appointment taking effect from July 1.

At the one hundred and fifty-third commencement of Columbia University on June 12, those who received advanced degrees in connection with the work carried on in the department of botany were Elsie Kupfer, who was granted the degree of doctor of philosophy, and Mary Morrell Brackett, Alice Adelaide Knox, Helen Letitia Palliser, and Maud J. Staber, who received the degree of master of arts.

The fourth annual field "Symposium," in which the Philadelphia Botanical Club, the Washington Botanical Club, and the Torrey Botanical Club will coöperate, will be held in the interesting region about Swartswood Lake, Sussex Co., New Jersey, July 1 to 8. The headquarters of the Symposium will be at the Hotel Waldmere, in the town of Newton, where a rate of $10 for the week has been secured. Those who expect to attend are requested to notify Mr. Joseph Crawford, president of the Philadelphia Botanical Club, 2824 Frankford Avenue, Philadelphia, Pa.

The summer meeting of the Vermont Botanical Club will be held in Pownal, July 2 and 3. Pownal is the extreme southwestern township of the state and it includes the only Vermont stations for *Liriodendron Tulipifera* and several other species of plants, and is said to be also the only known station in New

England for *Aster sagittifolius* and a few other species. The limestone region about North Pownal produces most of the rare plants but the extensive bogs in the eastern part of the town offer much of interest to botanical collectors. The headquarters for the meeting will be at the Hotel Glenwood, North Pownal, where members and their friends will assemble on the evening of July 1.

Benjamin Davis Gilbert, well known as an amateur student of the ferns, died at his home in Clayville, New York, on June 3, in the 72d year of his age. Mr. Gilbert was a graduate of Hamilton College in the class of 1857. From 1860 to 1876 he was engaged in the book trade in Utica, N. Y., and from 1877 to 1888 he was connected with the *Utica Morning Herald*, during much of this time as as literary editor and later as agricultural editor. Between 1892 and 1897 he was secretary of the New York State Dairymen's Association and edited its annual reports. Mr. Gilbert's interest in ferns began in early life. In addition to his personal collections in the United States, he had gathered ferns in Martinique, St. Thomas, Jamaica, and Bermuda. His botanical papers were published chiefly in the *Fern Bulletin* and in the *Bulletin of the Torrey Botanical Club.*

OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 33, published in 1906, contained 635 pages of text and 26 full-page plates. Price $3.00 per annum. For Europe, 14 shillings. Dulau & Co., 37 Soho Square, London, are agents for England.

Of former volumes, only 24–33 can be supplied entire; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Vols. 24–27 are furnished at the published price of two dollars each; Vols. 28–33, three dollars each.

Single copies (30 cts.) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–11 and 13 are now completed and Nos. 1 and 2 of Vol. 12 have been issued. The subscription price is fixed at $3.00 per volume in advance. The numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **The Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

THE TORREY BOTANICAL CLUB
Columbia University
NEW YORK CITY

Vol. 7 July, 1907 No. 7

TORREYA

A Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE AND PHILIP DOWELL

JOHN TORREY, 1796–1873

CONTENTS

Published for the Club
At 41 North Queen Street, Lancaster, Pa.
by The New Era Printing Company

[Entered at the Post Office at Lancaster, Pa., as second-class matter]

THE TORREY BOTANICAL CLUB

TORREYA is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, fifteen cents. To subscribers elsewhere, five shillings, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to TREASURER, TORREY BOTANICAL CLUB, 41 North Queen St., Lancaster, Pa., or Columbia University, New York City.

Matter for publication should be addressed to

MARSHALL A. HOWE
New York Botanical Garden
Bronx Park, New York City

Vol. 7. No. 7.

TORREYA

July, 1907

NOTES ON SOUTHERN VIOLETS — II

By Homer D. House

In Small's Flora of the Southeastern United States, Mr. Pollard, who has contributed the treatment of the Violaceae, does not credit *Viola cucullata* Ait. to this region. This species does however occur in this region and is represented by two rather distinct forms. Applying to them the key for the species of *Viola* in Small's Flora places them under *V. papilionacea* Pursh, as described by Mr. Pollard. *Viola papilionacea* is of a different group of species from *V. cucullata* and is recognized by its horizontal or ascending cleistogamous flowers on short peduncles, developing into short, blunt capsules, the sepals of the petaliferous flowers never with the prominent basal auricles of *V. cucullata.* In fact, *Viola cucullata* has more in common with *V. Brittoniana* than with any other species. Professor Greene* recognizes more than one species in the *V. cucullata* of recent manuals and, of these, *V. macrotis* is very distinct from the common form of *V. cucullata* in leaf character and habitat. In the southern Appalachian mountains it is the commonest representative of the group, while in the wet places along streams of the Piedmont region adjacent to the mountains another species is found.

Viola macrotis Greene, Pittonia 5: 97. N 1902.

Leaves of the summer foliage with pale-green, subsucculent blades, broadly ovate, acute, shallowly cordate, crenate-dentate, 6–10 cm. long and frequently broader, slightly pubescent on the veins beneath and on the peduncles: petaliferous peduncles exceeding the leaves until well after the flowering period: cleis-

* Pittonia 5: 96–101. N 1902.

[No. 6, Vol. 7, of Torreya, comprising pages 113–132, was issued June 19, 1907.]

FIGURE 4. *Viola oconensis* House; *a*, plant, nat. size; *b*, a lateral sepal, $\times 4$; *c*, an upper sepal, $\times 4$; *d*, detail of petals, nat. size.

togamous flowers erect on shorter peduncles, and the subsequent capsules 10–14 mm. long, angled and acute.

Moist shady stream banks and around springy places in the deeper coves of Rabun Bald, Rabun Co., Georgia, alt. 2000–3500 ft. *H. D. House, 2296*, June 1–4, 1906.

Viola oconensis sp. nov.

Related to *V. cucullata* of the north. Rootstock ascending, branched, often elongated : early leaf-blades round-ovate, shallowly cordate, obtuse, crenate, 1.5–3.5 cm. long, glabrous : summer foliage appearing with the flowers; petioles 8–15 cm. long, slender, pale and glabrous or with a few scattered hairs ; blades oblong-ovate in the earlier leaves to triangular-ovate in the later ones, 4–5 cm. long, 2–3.5 cm. broad, acute to sub-acuminate, deeply cordate and cucullate at the base, crenate or crenate-serrate, bright-green, rather thick and firm in texture, the veins prominent beneath, hispidulous above with minute whitish scattered hairs or glabrous with age : peduncles mostly exceeding the leaves at all stages, glabrous or slightly pubescent, 10–30 cm. long, bracts minute, subulate, not opposite : sepals linear-lanceolate, long-pointed, with whitish margins, 10–14 mm. long, the basal auricles prominent, blunt, the auricles and sometimes the margins of the sepals with a few short cilia : corolla 2–3 cm. broad, bright-blue but not purplish, the upper and lateral petals broad and rounded, the lower petal lance-oblong, obtuse and conspicuously veined with purple, the lateral pair bearded with small tufts of white papillae : cleistogamous flowers acute, erect on peduncles 8–20 cm. long, their capsules about as long as the sepals, acute. [Figure 4.]

In swampy thickets of elder and smilax along a small "branch" near Clemson College, Oconee Co., South Carolina, *H. D. House, 1839*, April 16, 1906, alt. about 800 ft. (type in the Clemson College herbarium ; duplicate types in the herbaria of the New York Botanical Garden and the National Museum). Near Pendleton (but in the S. E. corner of Oconee Co.) *H. D. House, 1801*, April 10, 1906.

At the last-named locality *V. sagittata* Ait. was abundant on an open wooded slope above, and around the margin of the swampy thicket in which grew *V. oconensis*, occurred several plants of intermediate appearance.

Viola oconensis × sagittata hyb. nov.

The early leaves with deltoid-ovate blades similar to those of *V. emarginata*, the later leaf-blades lanceolate-oblong, showing at the base both cucullate and sagittate characters; slight traces of pubescence often found on the upper leaf surfaces and peduncles: the flowers large, 2–3 cm. broad and purplish-blue; petaliferous flowers apparently not developing capsules, the peduncles withering soon after flowering: cleistogamous flowers numerous but their capsules small and abortive.

Low meadows, bordering swamps in which occurs *Viola oconensis;* near Pendleton (but in Oconee Co.) South Carolina, *H. D. House, 1804*, April 10, 1906.

The extent of my field studies thus far shows that this region is no exception to those localities already studied by the writer in regard to the abundance of natural hybrids among the violets. Many forms are under observation and the hybrids thus far detected are as follows:

Viola emarginata × sagittata Brainerd, Rhodora **8**: 58. 1906.
Tomassee, Oconee Co., *H. D. House, 2026*, May 5, 1906.

Viola emarginata × papilionacea House, Rhodora **8**: 120. 1906.
Open coves at limit of cultivation, Rabun Bald, Rabun Co., Georgia, *H. D. House, 2254*, June 1–4, 1906.

Viola palmata × villosa Brainerd, Rhodora **8**: 56. 1906.
Open woods with *V. palmata* and *V. villosa*, near Clemson College, Oconee Co., South Carolina, *H. D. House, 1930*, April 25, 1906.

Viola affinis × villosa Brainerd, Rhodora **8**: 56. 1906.
Near Clemson College, Oconee Co., S. C., *H. D. House, 2357a*, June 15, 1906.

Clemson College, South Carolina.

NOTES ON SOME FERNS COLLECTED NEAR ORANGE, NEW JERSEY

By Ralph Curtiss Benedict

The ferns under consideration were collected on a trip with the Torrey Botanical Club on June 22, 1907. The route lay over part of the range of hills known as the Orange Mountains,

and included in its course a variety of wooded hills and swamps and open fields.

An old well contained the first fern of especial interest, a small plant of the Japanese *Cyrtomium falcatum*, a fern commonly cultivated for fern-dishes, and related to our genus *Polystichum*. Its occurrence at that place is explained by the presence of a greenhouse near by, from which the spore which produced this plant was presumably blown. It grew in a crevice of the well-coping, protected from either extreme heat or cold by the partly open flooring of the well-house, and was of a size to indicate that it lived through at least one winter. With a little protection, it should prove hardy in the latitude of Washington and further south.*

Of the native ferns, about twenty species were seen, including members of eight genera of the Polypodiaceae, of *Osmunda*, and of *Botrychium* and *Ophioglossum*. The last was found in an old sedgy meadow, apparently a former lake which had been filled in by vegetative growth. After a close search, a considerable supply was found but it was not yet matured. For those who have not found this fern growing, a descriptive note may be of interest. The texture is soft and flabby, almost exactly like that of the common sheep-sorrel, *Rumex Acetosella*, but the color is lighter and the leaf, of course, is not lobed.

A low wet woods in the same valley contained a fine series of the *Dryopteris marginalis-spinulosa-cristata* group, including some of the less common members.

D. MARGINALIS, in its normal form, was found here and throughout the trip.

D. SPINULOSA. The form usually considered the type was found several times. It seems to be commoner in this region than the variety *intermedia* and grows generally in low damp woods. In central and northern New York, the reverse is true. The common form is *D. spinulosa intermedia*, which frequents rocky slopes and upland woods, but is found at its best on shady exposures. The form I identify as the type varies considerably in the cutting of the frond, but is probably never so much

*The writer has since seen this fern in cultivation out-of-doors at Stamford, Conn., where it is protected in the winter by a few inches of leaves.

divided as the variety, and the pinnae and pinnulae are generally more distant. It may include more than one form.

D. SPINULOSA INTERMEDIA. Only one or two clumps were found. Besides the characters ordinarily given, this variety may be distinguished from the preceding in two respects. It matures its sori a month or more earlier ; in this latitude, about the middle or last of June. Its sporangia appear dark-brown or blackish, as compared with the pale-brown sporangia of the so-called type form. There seems to be some question whether the type form really occurs in this country. A representative set of the species, comprising our three recognized forms, was sent to Dr. Christ of Basel, Switzerland, who identified all the specimens as *D. spinulosa exaltata*, a European variety. This, however, was not justified by the material.

Is it not probable that we have included under this species a complex of independent and mostly coördinate forms, corresponding, perhaps, to the known varieties ; in other words, elementary species? Such forms as appear to intergrade might be explained as crosses. A point in favor of this explanation is found in the fact that not infrequently such intermediate forms have only abortive sori and sporangia, a character nearly always associated with the recognized hybrids of *Dryopteris*.

D. CRISTATA. Frequent, the commonest of the group.

D. CLINTONIANA (D. C. Eaton) Dowell * (*D. cristata Clintoniana*). Distinguished from the preceding by its much broader and larger fronds ; the sori, also, are much closer to the midveins of the pinnulae. Several plants were seen.

D. BOOTTII. One group of vigorous plants.

D. CRISTATA × MARGINALIS. One group of strong plants with hardly an abnormal frond.

Cultural and field work is being carried on with the hope of clearing up some of the points of difficulty regarding these species and the writer would be glad to exchange material collected in this locality and in central New York for specimens from other sections.

NEW YORK BOTANICAL GARDEN.

* Proc. Staten Is. Assoc. 1 : 64. My 1906.

A ROUND-LEAVED RED RASPBERRY

By William H. Blanchard

Our red raspberry (*Rubus strigosus* Michx.) is somewhat variable, though probably much less so than the rather closely related *R. Idaeus* L. of the Old World. A careful study of the variations of our species would be very interesting and is in fact much needed. Until quite recently no variation had been noticed which seemed to merit separation as a species or a variety, though it is possible that some had been found to which names as forms might have been given with advantage, thus stimulating more careful observation and record.

But, on June 9, 1900, Mr. W. W. Eggleston, then living in Rutland, Vermont, found a remarkable plant in Cavendish, Vt., on the Black River near the Ludlow line. It was described by Mr. M. L. Fernald, of the Gray Herbarium, to which it was sent, in Rhodora **2**: 195–200, and to his very interesting discussion attention is now called as well as to the full-page illustration drawn by Mr. C. E. Faxon, which prefaces the article.

In this article Mr. Fernald makes *R. strigosus* a variety of *R. Idaeus*, and our American red raspberry by his disposition becomes *R. Idaeus* L. var. *strigosus* (Michx.) Fernald. It is not very probable that many American botanists will accept this rearrangement, though it must be admitted that some of the herbarium material from northern Europe and Siberia appears to be much like some that is found in America. He calls Mr. Eggleston's plant *R. Idaeus* var. *anomalus* Arrhenius (*R. Leesii* Babbington), an interesting round-leaved dwarf form of Europe which it resembles in some respects, especially in the shape of its leaves. But they are manifestly not the same, being quite as different as *R. Idaeus* and *R. strigosus*, and there is as much occasion for giving them distinguishing names. The European dwarf has the distinguishing characters of *R. Idaeus* while the Cavendish plant has those of *R. strigosus*. Mr. Eggleston's plant is very slender and delicate; the bark on old canes is of reddish straw-color and has a few short, rather strong prickles; the small and slender

bristles and hairs on the peduncles, pedicels, and calyx are tipped with glands. *R. Idaeus* var. *anomalus*, judging from the specimen in hand, is a stocky plant with gray bark covered with very numerous, long, straight bristles, while the petioles, peduncles, pedicels, and calyx are similarly covered with glandless bristles. It is interesting here to note that in the opinion of Mr. Fernald this absence of glands in *R. Idaeus* is the character which best distinguishes *R. Idaeus* from *R. strigosus*.

Mr. Eggleston's plant according to Mr. Fernald's general view should be treated as an intergrading variety between *R. Idaeus* var. *anomalus* and *R. Idaeus* var. *strigosus*. This would make from the four forms of red raspberries now known one species and three varieties. The writer prefers to regard *R. strigosus* as a distinct species. Mr. Eggleston's plant may be properly treated either as a variety of *R. strigosus* or as a distinct species. The prevailing custom among American botanists is to make so distinct a plant a species and it is here so treated. The European dwarf has been so considered. This gives us four species; *R. Idaeus* L., *R. Leesii* Babbington, *R. strigosus* Michx. and

Rubus Egglestonii sp. nov.

Allied to *R. strigosus* Michx., the bark, prickles, flowers, and fruit being very similar; plants glandular, dwarfish, about one foot high; leaves small, rounded, coarsely crenate-dentate, one to one and one-half inches broad, trifoliolate with rounded, sessile leaflets on new canes and varying from unlobed to deeply lobed on old canes; inflorescence very scant, consisting of two- to four-flowered slender racemes.

Type collected by Mr. W. W. Eggleston in Cavendish, Vermont, June 9, 1900.

It is possible that this is a mere sport but not at all probable, and botanists may well be watching for it in other places, especially far to the north where it may reasonably be expected to be not rare.

OBSERVATIONS ON THE FORMATION OF ALGAL PAPER

By John W. Harshberger

A few years ago my attention was called to a felted mass of material collected in several places in eastern Pennsylvania on the margins of ponds, lakes, and reservoirs, as well as on Lake Champlain. A microscopic study of this material showed me that it comprised the matted remains of green algae and diatoms that had been blown together by the wind, and later dried, so as to form sheets of paper. The notes below give the results of my investigation.

Samples of pond paper were submitted to me by Dr. G. F. Gilbert, of Honey Brook, Pa., where it was formed in the reservoir of that place, and by Miss Elizabeth Woolman, of Lansdowne, Pa. The paper from Honey Brook was formed by the matting together of oak leaves, some pretty well decomposed, others dry, brown and firm, and matted filaments of *Oedogonium* sp., with numerous detached oögonia and oöspores, *Diatoma vulgaris*, *Bumilleria* sp., *Tabellaria floccosa*, *Tribonema bombycinum*, *T. bombycinum* forma *minus* and *Euastrum simplex*.

The felt submitted by Miss Woolman (now Mrs. Aldrich Pennock) was much finer in texture and more uniform in appearance. It consisted of an almost pure mass of the filaments of *Oedogonium fragile*. None of the filaments of this mass were in the fruiting condition, nor were the cells so badly collapsed.

An asbestos-like felt was received from Dr. Charles H. Frazer from W. C. Richardson, collected at Essex, Lake Champlain, in June, 1904. This asbestos-like felt was found to consist of frustules of a *Navicula*, the species of which I have been unable to determine. In addition to *Navicula*, I found a few disjointed segments of *Tabellaria floccosa*, together with a few filaments of an undetermined alga which assisted in the formation of the felted mass.

Through the courtesy of Dr. Adolph W. Miller, I received some algal felt from Dr. H. M. Freas, of Philadelphia, gathered

by him in Gustine Lake, Fairmount Park. Upon examination, this proved to consist of almost pure felted masses of *Tribonema bombycinum.*

Having determined the plants which enter into the composition of the algal paper mentioned above, it is important to describe the method of its formation. All of the forms of algae mentioned above are free-floating kinds ordinarily described as freshwater plankton. When floating on the surface, such plants are driven about by the wind that blows over the surface of the lake or pond. Smaller masses of floating algae are blown together until large mats are formed, in which dead leaves and other material may be incorporated, and these mats may be blown to the shore and anchored by drifting into shallow water. If such rafts of material occur in a reservoir, as at Honey Brook, the drawing off of the water would cause the stranding of the rafts. The water held in suspension in the interstices of the filaments evaporates and the cells dry up and extensive sheets of algal paper are thus formed. In the case of algal rafts stranded on the shores of ponds and lakes, the advent of hot weather and the lowering of the general level of the water by evaporation would cause in a similar manner the formation of the algal paper, or felt.

The composition of this paper depends on the algae which are present in the pond when the formation of the paper begins. The paper may consist entirely of one plant, as in the diatomaceous and oedogonial papers, or in a mixture of a number of diverse types of green algae with diatomaceous frustules and the remains of leaves blown into the pond from bordering forest trees.

University of Pennsylvania.

SHORTER NOTES

The Taxonomy of a Leaf-Spot Fungus of the Apple and other Fruit-Trees. — The "brown-spot" disease of apple leaves was doubtfully attributed to the fungus *Phyllosticta pirina* Sacc. by Alwood * in 1892. The same fungus occurs on the leaves of pear, quince, and plum, and the disease is known by the name of "leaf-spot," "frog-eye," etc.

* Alwood, W. B. Va. Agr. Exp. Sta. Bull. 17 : 62. 1892.

An examination of a considerable number of specimens of the fungus on apple and quince leaves shows that the spores in the more mature pycnidia are not "hyaline," as originally described by Saccardo,* nor "slightly smoky," as described by Martin † and by Ellis and Everhart ‡, but considerably smoky, even approaching olive-brown, the depth of color depending upon the maturity of the spores. There is a possibility that the descriptions referred to were made from immature specimens.

I have been able to obtain artificial cultures of the fungus readily. In the cultures, the spores ooze out of the pycnidia in dull black masses. The culture work is being continued and inoculations are being made by Mr. Carl P. Hartley, whose results will be published later.

The color of the mature spores is more like the color of the spores of a *Coniothyrium* than a *Phyllosticta*, and *Coniothyrium tirolense* Bubák,§ occurring on pear leaves, may be only a mature *Phyllosticta pirina* Sacc. I have not had an opportunity to compare specimens of the two fungi.

On account of the color of the spores as they have been found on the leaves and as they develop in artificial cultures, together with the general character of the pycnidia, it seems advisable to transfer the fungus from the genus *Phyllosticta* to the genus *Coniothyrium*, and the name **Coniothyrium pirina** (Sacc.) (= *Phyllosticta pirina* Sacc. Michelia **1**: 134. 1878) is proposed.

Acknowledgments are due to Mrs. Flora W. Patterson, mycologist of the United States Department of Agriculture, and to Professor P. A. Saccardo, to whom specimens of the fungus on apple and quince leaves were submitted for determination and comparison with type specimens of *Phyllosticta pirina* Sacc.

John L. Sheldon.

West Virginia Agricultural Experiment Station,
Morgantown, W. Va.

---

* Saccardo, P. A. Michelia **1**: 134. 1878. Syll. Fung. **3**: 7. 1884.

† Martin, George. Journ. Mycol. **2**: 17. 1886.

‡ Ellis, J. B., & Everhart, B. M. The North American Phyllostictas, 36. 1900.

§ Bubák, Fr. Oesterr. Bot. Zeitschr. **54**: 183. 1904. Saccardo, Syll. Fung. **18**: 309. 1906.

The Range of Vaccinium virgatum. — For the last two or three years I have been endeavoring to secure more complete specimens of the different species and forms of blueberries and huckleberries occurring in New Jersey than are usually to be found in herbaria. With this end in view I have marked quite a number of shrubs in different localities, and from them have secured as complete material as possible, my aim being to obtain from the same plant flowers, fruit and both young and mature foliage. Several peculiar forms have been met with and some of the species show an unusual amount of variation. Such forms and variations are now being studied as opportunity offers, but one of the discoveries growing out of the collecting is so interesting that I now wish to call attention to it.

The interesting discovery referred to is that *Vaccinium virgatum* Ait., which has heretofore been known only from Virginia and southward, is rather common in the pine-barren region of New Jersey. I have specimens from several localities around South Amboy as well as from Tom's River, and there are incomplete specimens from the latter place in the herbarium of the New York Botanical Garden, as also from Staten Island.

In general aspect the plant has much the appearance of a gigantic *Vaccinium pennsylvanicum* Lam., the strongly serrulate leaves and greenish warty branches markedly resembling those of that species. However, its true relationship is with the exceedingly variable *Vaccinium corymbosum* L. From this the strongly serrulate leaves quickly distinguish it. Dr. Small's recently described *Vaccinium simulatum* cannot be confused at flowering time, as it has a short corolla like *Vaccinium vacillans* Kalm, while our plant has a long corolla like *V. corymbosum.* Dr. Small's species seems, too, to be more a plant of the mountains, and *V. virgatum* to be more a plant of the lowlands. Fruiting specimens of the two species are, however, separated from one another with difficulty.

The New Jersey form like the southern form develops the earlier flowers (which are usually but little tinged with rose) before the leaves, but many of the flowers remain until after the leaves are nearly fully grown. The pubescence of the young

leaves is not strongly developed, but nevertheless persists on the lower surface of the mature leaves, especially on the veins. The fruit is abundant and resembles in size that of *V. corymbosum.* In color, however, it is much more variable, ranging from dark-blue with a little bloom to blackish with no bloom, thus showing a very similar variation to that exhibited by the common huckleberry [*Gaylussacia baccata* (Wang.) K. Koch].

Judging from the original description of *V. virgatum* by Aiton (Hort. Kew. **2**: 12) written in 1789, the plant intended to to be named cannot be told with any certainty, but in Watson's Dendrologia Britannica (*pl. 33*) there is a good plate of the plant cultivated in Great Britain under that name — evidently the same species to which the name is applied in America. The extension of its range northward into New Jersey and New York is, of course, not at all surprising when one considers the large number of southern forms with a similar range.

KENNETH K. MACKENZIE.

EAST ORANGE, NEW JERSEY.

REVIEWS

Kraemer's Text-book of Botany and Pharmacognosy*

This book is intended for the use of students of pharmacy, as a handbook for food and drug analysis and as a work of reference. It appears as a second edition of a former work of Professor Kraemer's, published in 1902, even though that had a slightly different title, and the subject-matter has been so changed and extended that it might well be issued as an independent work. The first edition was a small octavo book of less than 400 pages, with 17 plates inserted at the close of the text, and with practically no discussion of botanical theory. The present volume is a larger octavo of over 800 pages, with 321 figures dispersed through the text, and over one fourth of the discussion is devoted to pure botany.

---

* Kraemer, Henry. A Text-book of Botany and Pharmacognosy. 8vo. vi + 840. *f. 1–321.* Second revised and enlarged edition. J. B. Lippincott Company, Philadelphia and London. 1907. $5.00 *net.*

The first three chapters deal respectively with the great groups of plants (three being recognized, *i. e.*, Thallophytes, Archegoniates and Spermophytes), the outer morphology of Angiospermae, and the inner morphology of higher plants. The selection of the material presented in this portion of the work has been made with care, and we believe that it establishes a standard decidedly in advance of the work that is generally being pursued in the colleges of pharmacy. Certain parts of the discussion will appeal to the botanist as formal and artificial. Such considerations, however, are a necessity to the pharmacist, who is often dealing with the mechanical features and mathematical measurements of plant structures in his analyses. The author has been obliged, perhaps of necessity, to content himself with the presentation of these facts, which are piled up in great detail. It appears to us that certain portions might have been shortened in order to give place to a fuller discussion of the relationship of the great groups of plants, the significance of morphological characters, and the forces operative in shaping them.

Chapter IV., dealing with the classification of angiosperms yielding drugs, and chapter V., on the cultivation of medicinal plants, are entirely new and of very general interest. In the classification of angiosperms the author gives a concise description of the plants yielding drugs and other useful products, as well as the non-official drugs derived from them. This portion of the work will be of service to the botanist and pharmacist alike. The orders and families of the Angiospermae are briefly characterized in the sequence of Engler and Prantl and the various medicinal plants are discussed under their respective families. In many cases no attempt apparently has been made to distinguish between the various orders and families, and probably this is the only practical course where the main consideration is the character of the plant rather than the diagnostic features of the groups, which are, in many cases, at present poorly understood. Much interesting information is presented in the discussion of the cultivation of medicinal plants, attention being called to the growing scarcity of many of the officinal plants and to the opportunity for the profitable cultivation as well as to

the improvement of the drug products by cultural conditions. Approximately 190 species are now cultivated in the United States while 178 species are growing wild, and in addition to this number probably 50 or 75 species from Europe and other countries might be profitably cultivated.

Part II. — Pharmacognosy — dealing with crude drugs and powdered drugs and food, consists of extended and greatly improved presentations of the same subjects as in the older edition. The attention attracted to this part of the work and especially the elaboration of keys for the identification of the crude and powdered drugs has already been noticed in TORREYA. It need only be added that the treatment has been greatly improved by the addition of numerous illustrations, and, in the chapter on drugs and foods, drawings and descriptions of the histological elements and contents of over 200 foods, spices, and drugs are given.

The work closes with a chapter on the various classes of reagents and on the technique involved in sectioning and mounting of specimens. CARLTON C. CURTIS.

Cook's Aspects of Kinetic Evolution*

The method by which the present order of things in the universe has been brought about is a problem whose solution has challenged the philosophically inclined from the time of the early Greeks and earlier to the present day. Among the various hypotheses that have been proposed may be mentioned the following :

I. *Special creation.* God made things ; *i. e.*, we do not know how the present order came about. The question is not a proper one for scientific inquiry. (Cuvier, Agassiz.)

II. *Evolution.* The present order came about as the result of a series of gradual changes. The changes by which the present order of living things resulted constitute organic evolution. Theories of organic evolution have been either *static*, regarding the organism as changing only when acted upon from without ; or *kinetic*, regarding the organism as changing spontaneously.

---

* Cook, O. F. Aspects of Kinetic Evolution. Proc. Wash. Acad. Sci. 8 : 197–403. 1907. Washington, D. C. Published by the Academy.

The theories may be grouped as pre-Darwinian, Darwinian and post-Darwinian.

(*a*) Pre-Darwinian. (Chiefly static.)

1. The environment (many of the factors of which are known) directly causes organisms to change. (Lamarck, de Maillet, Nägeli, and others.)

2. The inheritance of the effects of use and disuse is a causal factor in the change. (Lamarck, Spencer.)

(*b*) Darwinian. (Partly static.)

The changes of variation (however caused) are of the kind known as continuous. Certain of these changes are perpetuated by natural, *i. e.*, environmental, selection. The fittest only survive. (Darwin, Wallace.) There have been several modifications of Darwinism as originally proposed by Darwin. Darwin, and especially Huxley, recognized the fact that variations might be spontaneous (kinetic).

(*c*) Post-Darwinian.

1. The variations of evolutionary significance are spontaneous (kinetic), and discontinuous (mutations). One method of evolutionary advance is by the operation of natural selection on mutations. Hybridization is also a factor. (De Vries.)

2. The variations involved in evolution are continuous and spontaneous (kinetic), resulting entirely from interbreeding (*symbasis*). Natural selection is not a factor in evolution. (O. F. Cook.)

This last hypothesis is most fully elaborated in "Aspects of Kinetic Evolution." According to the author, "The kinetic theory of evolution finds in the facts of organic development indications that the characters of species change spontaneously, or without environmental causation (p. 197), and holds "that evolution arises from the association of organisms into interbreeding groups, or species" (p. 290).

Evolution, "the process of change by which the members of an organic group become different from their predecessors, or from other groups of common origin" (p. 277), differs from speciation, or "the attainment of differential characters by segregated groups of organisms, that is, by subdivision of older species (p.

278). "Symbasis is the normal evolutionary condition of free and extended interbreeding among the individual members of natural species" (p. 277).

The above quotations indicate what, in the mind of the author of the hypothesis, is the essential difference between this hypothesis and its predecessors. The reader is "duly warned" (p. 295) that "kinetic evolution does not come as an amendment to natural selection," for "selection is not merely inadequate as the cause of evolution; it is not an evolutionary cause at all, in the concrete physiological sense."

In harmony with the theory, it is most important to distinguish:

Heterism — "the diversity of individuals inside the species" (p. 318).

Evolution — the process of change of type through the assemblage of variations by inbreeding (*symbasis*). Symbasis may not cause variation (p. 318), but it is the cause, *par excellence*, of evolution.

Speciation — "The attainment of differential characters by segregated groups of organisms" (p. 278). "Evolution depends upon symbasis, speciation upon isolation" (p. 278).

Incidentally, in this connection, it seems pertinent to inquire how, since there is no "law of heredity," * can variations be assembled, since they would not be transmitted from parent to offspring.

The mere proposal of a theory of evolution, purporting to be diametrically opposed to all preceding theories, and whose acceptance implies the total rejection of the latter as not only inadequate but misleading and fundamentally false, is not only a bold claim, but it at once challenges the closest examination and comparison and the most rigid criticism.

In a careful reading of the book, one is impressed with the conspicuous absence (with few exceptions) of definite citations in referring to the literature dealing with other theories, and of an entire disregard, in some instances, of other work that has a direct bearing upon the theory proposed as new. For example,

---

* Cook, O. F., & Swingle, W. T. Evolution of Cellular Structures. Bull. Bureau Plant Industry, 81: 9. 1905.

in denying (p. 222) "any directly causal connection between evolution and environment," there seems to be no recognition of the fact that environment may operate directly upon the germ-cells and cause variations, which, as MacDougal has experimentally shown, are undoubtedly inherited. Again, in discussing "Differences in Growth-stages" (p. 237), no mention is made of Diels' recent and very pertinent work on "*Jungendformen und Blütenreife im Pflanzenreich.*" Also no reference is made to Blaringhem's work on the inheritance of the effect of injuries, which surely has a bearing on environment as a causal factor.

One wonders if "Diversity of Normal Descent (Heterism)" p. 244, *et seq.*) is offered as an original idea. Such seems clearly to be the implication, and yet memory persists in recalling Bailey's "The Survival of the Unlike," * and his "Cross-breeding and Hybridizing" (p. 5), to which no reference is made, and the older "Bathmism" of Cope, and, to go still further back, the clear statement of the idea by Herbert Spencer.†

Here and there throughout the book the term "evolution" seems to be used as synonymous with "organic evolution"; *e. g.*, "Evolution is a name for the process of gradual change by which the diversity of organic nature has come about" (p. 284). So, also, on page 277, quoted above. Furthermore, there seems to be a redefinition of old terms, and then the employment of these terms as newly defined when discussing Cookism, but as previously defined when referring to other theories. For example, on page 314, isolation, considered a factor in (organic) evolution (old definition), is rejected as a factor in evolution (new definition, *i. e.*, variation through symbasis). From this the *non sequiter* is inferred that the theories are wide apart.

In referring to de Vries's theory of mutation, it is stated that "Professor de Vries argues, in some of his writings, that mutations are due to environmental causes," yet no reference is made to the following statement of de Vries: "The variability of species is independent of environment. In my experiments the mother species mutates in all directions. . . . The mutation

* See, *e. g.*, pp. 20, 25, and 53 of that work.

† Principles of Biology 2 : 329. 1900.

therefore is independent of environment, its direction is not governed by circumstances." * Or, in "Species and Varieties" (p. 696), "the ordinary external conditions do not necessarily have an influence on specific evolution."

If the statement (p. 322) that, "The evolution is in the species, the power of deflection in the environment," by contrast with the quotation on the same page from de Vries that "By this means natural selection" (said, in the same paragraph, to be "not a force of nature, no direct cause of improvement") "is the one directing cause of the broad lines of evolution," is meant to point out a difference in the two theories, the close propinquity of the two sentences seems quite unfortunate.

Possibly, also, the statement that, according to de Vries, new characters, in order to be preserved, must be environmentally useful (p. 281), would not have been written if notice had been taken of de Vries's declaration that, "Harmless or even slightly useless ones (mutations) have been seen to maintain themselves in the field during the seventeen years of my research . . . ." And on page 281, the cart and horse are surely reversed, when it is stated that, according to de Vries, "new species have to be made, in order to originate and preserve new characters."

If evolution, "represents the working of no special . . . . mechanism" (p. 323), it is difficult to understand how "The final and ultimate explanation of evolution must await an understanding of the constitution of living matter" (p. 323), or what the positions of "granules derived from a given ancestor" have to do with evolution. We cannot escape mechanisms by writing atoms and molecules, or granules, instead of chromosomes.

De Vries is said (p. 362) to "especially insist" on the tenet that the idea of species is "founded on identity of form and structure," and is quoted six lines below as saying that "purely uniform species seem to be relatively rare." If the term species is used in each of these cases with the same meaning, the discrepancy between the interpretation and the quotation is quite evident, and even more so when we recall de Vries's statements in "Species and Varieties," that, in species, "All sorts of variability occur, and no individual or small group of specimens can really be considered

* De Vries, Hugo. Science, II. 15 : 727. 1902.

as a reliable representative of the supposed type" (p. 37). "We may conclude that systematic species, as they are accepted nowadays, are as a rule compound groups" (p. 38). These quotations can hardly be interpreted as an insistence upon the dictionary definition of a systematic species.

Anyone who holds that the term species cannot be given a definition acceptable to all systematists has returned to a "mediaeval" type of reasoning (p. 362), and taxonomists may now choose from arropic, ropic, subsexual, semisexual, sexual, supersexual, symbasic, porric, stenic, linic, and clonic species (p. 389 *et seq.*).

Typographical errors are rare, but on p. 234 it seems that "*intra*spective" should be read "*intra*specific."

The lack of qualitative variations in such species as, *e. g.*, *Liriodendron Tulipifera*, or in species of the diatoms, which have persisted unchanged through many geological epochs, and the coexistence of closely related species without isolation, environmental or physiological, are some of the problems which seem more difficult of solution on the basis of "kinetic evolution" than otherwise.

Emphasis upon the idea of kinetic variation in organic evolution is a distinct service, and the idea is of increasing interest in the light of the recent revelations of physical chemistry, pointing strongly to the evolution of the chemical elements by spontaneous transformations, that is, by a kinetic inorganic evolution. The volume, however, does not refer to this closely related phenomenon, and kinesis is discussed only with reference to the realm of the organic.

C. Stuart Gager.

PROCEEDINGS OF THE CLUB

May 29, 1907.

The Club met at the museum building of the New York Botanical Garden at 3:30 o'clock, with an attendance of twenty.

Dr. John Hendley Barnhart was called to the chair.

After the reading and approval of the minutes of the meeting of May 14th, the following scientific program was presented:

"*The Linnaean and other early-known species of Crataegus,*" by Mr. W. W. Eggleston.

The earliest record found of American *Crataegi* is by Caspar Bauhin, in 1623. It is as follows:

"*Mespilus virginiana colore rutilo. Mespilus, qui colore est rutilo ut cerasa & valde dulcis*, part I, Ind. occid."

The latter part of this quotation probably refers to the Historia Medicinal, by Monardes, published in 1569.

Lists of plants raised in the botanical garden at Leiden, published by Hermann in 1687, by Boerhaave in 1720, and by Royen in 1740, and in the Schola Botanica published at Paris in 1687, as well as Linnaeus's own lists (Hort. Cliffortianus and Hort. Upsaliensis), give short references to American Crataegi; but it is to the English botanist Plukenet that we owe our first real knowledge of American thorns. His plates and descriptions are referred to by Linnaeus, and these, with his references, are invaluable to us.

Contemporary with Plukenet was Ray, who also added somewhat to our knowledge. John Banister of Jamestown or Williamsburg, Va., must have contributed much to Plukenet's knowledge, as he was the first English botanist to live in Virginia, and as he sent many seeds and specimens to England.

This Chesapeake Bay region produced all of the Linnaean species, except the one that has been referred to as *C. tomentosa.* This might have been brought from farther back in the country, perhaps by the Indians, as it was one of the earliest thorns raised in England, and is not found in the coastal plain.

In Plukenet's Phytographia, published in 1591, are five figures of American Crataegi; Plukenet says that he saw the species illustrated in his plate 46, fig. 1, in the garden of the Hon. Charles Howard in Surrey. This specimen Linnaeus refers to *Crataegus Crus-galli.* A colored plate of it is published in the "List of Plants raised for sale by the English Gardeners about London" (Hort. Brit.), published in 1730. This is the plant labelled in the Linnaean herbarium as *C. tomentosa.* About this Miller was undoubtedly right, for Plukenet's description will cover no other American thorn, certainly none other that was raised in England at that time.

Plukenet's fig. 2, plate 46, undoubtedly refers to *C. Phaenopyrum* (Linn. f.). There is a good plate of this in Hort. Brit. Linnaeus referred this plate to *Crataegus coccinea*, and it has long been incorrectly referred to as *C. cordata* (Miller).

Plukenet's fig. 4, plate 46, is the first figure referred by Linnaeus to *Crataegus coccinea*. This figure and description require a smooth thorn with broad, slightly lobed leaves, and a red, two-seeded fruit. The only known American thorn that fits this description is *C. Margaretta* Ashe (= *C. Brownii* Britton). This was not known from the coastal-plain region, but there is a specimen in the U. S. National Museum from Maryland. Fig. 5, of plate 99, is a young shoot of *Crataegus Crus-galli* L.

Plate 100, fig. 1, was referred by Linnaeus to *Crataegus tomentosa*. This is the same as *Crataegus uniflora* Muench., or *C. parvifolia* Aiton. It is a common coastal-plain species, which both Banister and Clayton must have collected in Virginia. Clayton mentions but one species with leaves hairy on the lower side, and the reference is doubtless to this species.

That Linnaeus did not know well the thorns he was describing is partially proved by his referring *C. Phaenopyrum*, a five-seeded species, to a two-seeded species. Miller's description of the *Crataegi* raised in England is invaluable to us in tracing out these Linnaean species. As Miller says, Linnaeus was doubtless misled by Kalm.

Crataegus viridis L. was collected and probably described by Clayton. About this species there can be no question for there is a Clayton specimen of *C. viridis* in the British Museum.

A colored plate was made by Ehret for *Plantae Selectae* beween 1750 and 1762. This may be the first illustration of *Crataegus flava* Aiton. It certainly belongs to the *flavae*, and was raised from seed sent from Carolina by Catesby in 1724. Another American thorn, *C. punctata*, was illustrated by Jacquin in Hort. Vind. 1770.

"*Further Remarks on the Botanical Exploration of the Bahamas*," by Dr. N. L. Britton:

Referring to a previous communication made to the Club and to others, printed in the *Journal of the New York Botanical Gar-*

den, Dr. Britton gave an account of the recent expeditions of Mr. L. J. K. Brace to Crooked Island, Acklin's Island, Long Cay (Fortune Island), and Andros, and of his own trip in February and March, in company with Dr. C. F. Millspaugh, to Eleuthera, Little San Salvador, Cat Island, Conception Island, Watling's Island, and Long Island. During the progress of this trip, Mrs. Britton explored the northern part of Eleuthera and did some collecting on New Providence. The greater portion of the archipelago has now been visited through the coöperation of the Field Museum of Natural History with the New York Botanical Garden, but the extreme southeastern islands, including Atwood Cay (Samana), Mariguana, and the Caicos Islands are as yet botanically unknown, and the central portion of the large island of Andros is a *terra incognita.* The small islands on the Cay Sal bank also remain unvisited. Dr. Britton exhibited specimens of many of the characteristic species and remarked on their distribution.

The Club adjourned until October 8, 1907.

C. Stuart Gager,
Secretary.

NEWS ITEMS

Professor Charles E. Bessey will again be acting chancellor of the University of Nebraska for the four months this summer and autumn during which Chancellor E. Benjamin Andrews will be on leave of absence in Europe.

Professor William Trelease, who has held the chair of botany in Washington University at St. Louis since 1885, was among those who received the degree of LL.D. at the recent commencement commemorating the fiftieth anniversary of the founding of that university.

It is stated in the *Botanical Gazette* that Dr. A. F. Blakeslee of Harvard University has been elected professor of botany in the Connecticut Agricultural College at Storrs, and that he will begin his duties the present year by acting as director of the summer school.

Mr. Charles Louis Pollard, recently botanical editor for the G.

& C. Merriam Company of Springfield, Mass., has been appointed curator of the Staten Island Association of Arts and Sciences, New Brighton, New York. The collections belonging to the Association are now stored in temporary quarters pending their removal to the new Richmond Borough Building, in which the museum is to be located.

Sir Dietrich Brandis, for many years inspector-general of forests to the government of India, died at Bonn, Germany, May 28, in the eighty-fourth year of his age. In addition to numerous reports on forestry matters, Brandis published in 1874 a work on the "Forest Flora of North-west and Central India" and in 1906 a large descriptive volume on "Indian Trees." In connection with his great work as "father of systematic forest management in the British Empire," he is credited with having had much influence in the establishment of an efficient forestry service in the United States.

Dr. Maxwell T. Masters, for more than forty years connected in an editorial capacity with the *Gardeners' Chronicle*, died at his home in Ealing, a suburb of London, on May 30. Dr. Masters' botanical interests were broad. Besides his numerous writings on topics relating to horticulture and gardening, he was the author of a standard work on "Vegetable Teratology," of "Botany for Beginners," of several papers on the taxonomy and morphology of the Coniferae, was editor of the second, third, and fourth editions of Henfrey's "Elementary Course of Botany," and was contributor of special parts to Martius' "Flora Brasiliensis" and to other important floras.

Vol. 7 August, 1907 No. 8

TORREYA

A Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE AND PHILIP DOWELL

JOHN TORREY, 1796–1873

CONTENTS

Published for the Club
At 41 North Queen Street, Lancaster, Pa.
by The New Era Printing Company
[Entered at the Post Office at Lancaster, Pa., as second-class matter.]

THE TORREY BOTANICAL CLUB

OFFICERS FOR 1907

President,
HENRY H. RUSBY, M.D.

Vice-Presidents,
EDWARD S. BURGESS, PH.D. LUCIEN M. UNDERWOOD, PHD., LL.D.

Recording Secretary,
C. STUART GAGER, PH.D.
Botanical Garden, Bronx Park, New York City.

Corresponding Secretary,
JOHN K. SMALL, PH.D.
Botanical Garden, Bronx Park, New York City

Editor,
JOHN HENDLEY BARNHART, A.M., M.D.
Tarrytown, N. Y.

Treasurer,
CARLTON C. CURTIS, PH.D.
Columbia University.

Associate Editors,
PHILIP DOWELL, PH.D.
ALEX. W. EVANS, M.D., PH.D.
TRACY ELLIOT HAZEN, PH.D.
MARSHALL A. HOWE, PH.D.
WM. ALPHONSO MURRILL, PH.D.
HERBERT M. RICHARDS, S.D.
C. B. ROBINSON, PH.D.
ANNA MURRAY VAIL.

TORREYA is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, fifteen cents. To subscribers elsewhere, five shillings, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to TREASURER, TORREY BOTANICAL CLUB, 41 North Queen St., Lancaster, Pa., or Columbia University, New York City.

Matter for publication should be addressed to

MARSHALL A. HOWE
New York Botanical Garden
Bronx Park, New York City

Vol. 7. No. 8.

TORREYA

August, 1907

THE GENUS PILOSELLA IN NORTH AMERICA

By P. A. Rydberg

PILOSELLA (Thal) Kostel. Enum. Hort. Prag. 104. 1844.
Arabidopsis (DC.) Schur. Enum. Pl. Trans. 55. 1866.
Stenophragma Celak. [Fl. Prager Umgeg. 1870] Flora 55: 438. 1872.

Prantl in Engler & Prantl, Pflanzenfamilien, adopted Celakowsky's genus *Stenophragma* for *Arabis Thaliana* L. and its relatives. There are, however, two older generic names available. Neither of these has been included in Harms's list of *genera excludenda* and they must be considered, whether one follows the American or the Vienna Code. The first of these was published by Kosteletsky in 1844. Kosteletsky not only gives the binomial *Pilosella Thaliana* but states in a footnote that it has been included in *Arabis* and *Sisymbrium* by authors. Furthermore, he credits the name *Pilosella* to Thal, by placing the name of the latter in parenthesis after the name *Pilosella*. *Pilosella siliquata minor* was described and figured by Thal in 1588 and it was the plant on which Linnaeus based his *Arabis Thaliana*. There is therefore no uncertainty about the identity of Kosteletsky's genus *Pilosella*. Some botanists require that a diagnosis (some even insist that this should be in Latin) should accompany a generic name in order to constitute publication, but such a requirement is always at least pedantic and in many cases simply ridiculous. In this case the identity of the genus *Pilosella* (then a monotype) is well established, and the plant was described and figured by Thal and described by Linnaeus.

It is true that the name *Pilosella* has been used for a part of genus *Hieracium*, but according to the American and the Vienna

[No. 7, Vol. 7, of Torreya, comprising pages 133–156, was issued July 19, 1907.]

codes it was not published as a genus in this sense until 1862, when it was published by the two brothers, Schultz of Zweibrücken.* Twelve years before that time (in 1850), F. W. Schultz had published a few binomials under the generic name *Pilosella*, but only as synonyms under species which he still retained in *Hieracium*. The earliest use of the name *Pilosella* for a group of *Hieracium* seems to be in 1542 by Fuchs. It was used in that sense by Dodoens, Camerarius, Caspar Bauhin, etc., and by Ruppius as late as 1745, but I have been unable to find it used as a genus after 1753 and before 1844. Should this, however, be the case, *Arabidopsis* Schur should be used for *Arabis Thaliana* instead of *Stenophragma*. When Schur established *Arabidopsis*, he not only cited *Arabis Thaliana* L., *Conringia Thaliana* Reich. and *Sisymbrium Thalianum* Gay, but stated that the genus was equivalent to De Candolle's *Sisymbrium* sect. VII., *Arabidopsis*. The writer cannot see why these two names should be ignored and the later *Stenophragma* be adopted. The following species of PILOSELLA are found in North America :

PILOSELLA THALIANA (L.) Kostel. Enum. Hort. Prag. 104. 1844.
Arabis Thaliana L. Sp. Pl. **2** : 665. 1753.
Conringia Thaliana Reichenb. Ic. Fl. Germ. **2** : *pl. 60.*
Stenophragma Thalianum Celak. Flora **55** : 442. 1872.
Arabis parviflora Raf. Am. Mo. Mag. **1** : 43. 1817.

A species introduced from Europe, and sparingly established from Massachusetts to Georgia and Kansas ; collected also in Utah.

Pilosella Novae-Angliae Rydb.

Arabis petraea Hook. Fl. Bor.-Am. **1** : 42, in small part. 1829. T. & G. Flora 1 : 80, mainly. 1838. Not *Arabis petraea* (L.) Lam. 1783.

Sisymbrium humile Wats. & Coult. ; A. Gray, Man. Ed. 6 : 71. 1890. Not *Sisymbrium humile* Ledeb. 1830.

Braya humilis Robinson, Syn. Fl. **1**[1] : 141, in part. 1895.

This plant seems to have been included in Hooker's *Arabis petraea*, but here evidently confused with *Arabis lyrata* Nutt. and

* Flora **45** : 417. 1862.

A. ambigua DC. The first time it was really distinguished was in Torrey & Gray's Flora ; but here the range is faulty, probably because these authors followed Hooker in this respect, and Dr. Pitcher's specimen belongs to *Arabis lyrata*. A somewhat better description we find in Gray's Manual, sixth edition, and in the Synoptical Flora; but in both it is confused with the Rocky Mountain plant, *i. e.*, the species which we next discuss. The first adequate description we find in Britton & Brown's Illustrated Flora,* where it is also figured. This description, as well as that in Britton's Manual, refers wholly to the eastern plant, but Alaska and Oregon should be excluded from the range.

Pilosella Novae-Angliae differs from *Sisymbrium humile* Ledeb. (Icon. Pl. Fl. Ross. **2**: 16. *pl. 147.* 1830) in the more compact habit, the scant pubescence, the smaller flowers, the more slender pod, and the longer style, which is about 1 mm. long.

Dr. Robinson refers the plant to *Braya*, but the type of that genus is so unlike this species both in habit and structure that the present writer can not follow him in his views. *Pilosella Novae-Angliae* has such a resemblance to *P. Thaliana* in many respects that it would be hard to deny the relationship. The structure of the pod is the same, the only difference being that the minute reticulation of the septum in *P. Novae-Angliae* is shorter and therefore approaches that of *Braya*. In habit, the main difference between the two species is that *P. Thaliana* is an annual, while the present species is a perennial.

The specimens at hand of *P. Novae-Angliae* are the following from Willoughby Mountain, Vt.: July, 1887, *Edwin Faxon* †; 1894, *A. J. Grout, W. W. Eggleston, & H. S. Jesup*; 1892, *H. H. Rusby*; 1866, *H. Mann*; 1881, *C. G. Pringle*.

Pilosella Richardsonii Rydb.

Sisymbrium humile (especially var. β) Hook. Fl. Bor.-Am. **1**: 62. 1830. Not *Sisymbrium humile* Ledeb. 1830.

Braya humilis Robinson, Syn. Fl. 1^1: 141, in part. 1895.

This also has been confused with *Sisymbrium humile* Ledeb.

---

* **2**: 116. *f. 1698.* 1897.

† As no type has been designated under any of the synonyms given above, this may be regarded as the type; it is preserved in the Columbia University herbarium.

and is nearer to it in general habit, but differs in the thicker leaves (usually deeply dentate), dense and very short pubescence, thicker and more torulose pod. These characters, together with the larger flowers, very short style, which is scarcely more than 0.5 mm. long, and the stems, decumbent at the base, distinguish it from the preceding species. The following specimens are at hand: Sandy Plains, Lower Bow Park, vicinity of Banff, Alberta, 1890, *McCalla 2272*; Banff, 1887, *J. Fowler*; about Mackenzie River, from lat. 60° to 68°, *Richardson*. Emerald Lake, Alberta, 1904, *J. Macoun 64433* and *C. H. Shaw 109*.

Pilosella virgata (Nutt.) Rydb.

Sisymbrium virgatum Nutt.; T. & G. Fl. **1**: 93. 1838.
Stenophragma virgatum Greene, Pittonia **3**: 138. 1896.
Arabis Brebneriana A. Nelson, Bull. Torrey Club **25**: 373. 1898.

The first one to transfer this species to a genus with *Arabis Thaliana* L. as the type was Dr. Greene. He was not, however, the first one who saw the relationship between these two species, for in Torrey & Gray's Flora they are associated with *S. humile*, *S. glaucum* Nutt. and *S. pauciflorum* Nutt. in a section Arabidopsis. Except the last one, which is doubtful and unknown to the writer, the group comprises just those species which the writer here regards as constituting in North America the genus *Pilosella*. The more he studies the work of Thomas Nuttall, who contributed most to the knowledge of these species as well as numerous others to Torrey & Gray's Flora, the more he admires that old botanist's acuteness. In ability to recognize relationships, he surpassed even Dr. Torrey and Dr. Gray.

The most extended description of this species was made by Professor Aven Nelson under the name of *Arabis Brebneriana*. The only discrepancy we find is that the valves of the pod are said to be "obscurely few-nerved," for besides the few obscure nerves there is in each a prominent midrib, making the pod angular just as in *Pilosella Thaliana*. The only difference in the structure of the pod is that the septum of the pod has a faint midrib, which is obsolete in *P. Thaliana*, *P. Novae-Angliae*, and

P. Richardsonii. Professor Nelson has later recognized the fact that *Arabis Brebneriana* is not an *Arabis*. He then distributed it as *Stenophragma.* Professor Nelson is easily excusable for having redescribed *Sisymbrium virgatum* under another name, for the more common plant known under that name is not Nuttall's plant, but an undescribed closely related species, which is diagnosed below. The only specimens of the true *P. virgata* seen by the writer are the following: Rocky Mountains, near the sources of Sweet Water, *Nuttall;* Colorado, *Hall & Harbour;* Wyoming, Fort Steele, 1897, *Aven Nelson 3135;* Laramie, 1899, *Aven & Elias Nelson 6827.**

Pilosella stenocarpa Rydb.

Biennial or perhaps a short-lived perennial; stem hirsute with branched hairs, usually simple up to the inflorescence; basal leaves oblanceolate, 2–3 cm. long, sinuate-dentate, short-petioled, hirsute-stellate; stem-leaves sagittate, sessile, about 2 cm. long; sepals oblong, about 2 mm. long; petals spatulate, 3 mm. long; fruiting pedicels 5–10 mm. long, ascending; pod 2.5–4 cm. long, glabrous, scarcely 1 mm. wide; beak about 0.5 mm. long.

This closely resembles the preceding in habit, but differs in the smaller flowers, narrower pod, and more distinct style. It is usually also more simple. In *P. virgata* the petals are usually 4 mm. long, the pod 2 mm. thick, and the style obsolete. A duplicate of Nuttall's *Sisymbrium virgatum* is in the Columbia University herbarium and it matches closely *Arabis Brebneriana* Nelson. The following specimens of *P. stenocarpa* have been seen: Wood Mountain, Assiniboia, 1895, *John Macoun 10007* (type, in Columbia University herbarium); Pole Creek, Wyoming, 1895, *Aven Nelson 1334;* Tie Siding, Wyo., 1896, *Osterhout;* Leucite, Wyo., 1901, *Merrill & Wilcox 480;* McCoys, Colo., 1903, *Osterhout 2763.*

Pilosella glauca (Nutt.) Rydb.

Sisymbrium glaucum Nutt.; T. & G. Fl. **1**: 93. 1838.
(?) *Turrites diffusa* Hook. Fl. Bor.-Am. **1**: 41. 1829.

* *Aven Nelson 1299* and *1902* may also belong here, but the fruit is too little developed for determination.

Sisymbrium salsugineum S. Wats. Bibl. Ind. 70. 1878. Not *Sisymbrium salsugineum* Pall. 1773.

Thelypodium salsugineum Robinson, Syn. Fl. 1[1]: 175. 1895.

Dr. Robinson referred this species to *Thelypodium*, but it lacks the most characteristic feature of that genus, *i. e.*, the sagittate and curved anthers. The flower and pod are almost exactly like those of *P. Thaliana.* Prantl * refers the closely related *Sisymbrium salsugineum* Pall. to *Stenophragma* and the writer thinks rightly so. He thinks, however, that the American plant is distinct from the Siberian, having smaller flowers and entire instead of coarsely toothed basal leaves. The only characters in which they do not agree with the typical *Pilosellae* are but trifling ones, viz: the lack of pubescence and the clasping stem-leaves.

A key to these species may here be added:

Stem-leaves not auriculate-clasping or sagittate at the base.
- Annual. — *P. Thaliana.*
- Perennial.
  - Stems erect; leaves thin, sparingly pubescent; style about 1 mm. long. — *P. Novae-Angliae.*
  - Stems decumbent at the base; leaves thick, densely stellate; style about 0.5 mm. long. — *P. Richardsonii.*

Stem-leaves auriculate-clasping or sagittate at the base.
- Plants pubescent, biennial or perennial.
  - Pod 2 mm. thick; style obsolete. — *P. virgata.*
  - Pod about 1 mm. thick; style 0.5 mm. long. — *P. stenocarpa.*
- Plant glabrous, annual. — *P. glauca.*

New York Botanical Garden.

THE MUSEUM AND LIBRARY OF THE STATEN ISLAND ASSOCIATION OF ARTS AND SCIENCES

By Charles Louis Pollard, *Curator*

The books and collections belonging to the Staten Island Association of Arts and Sciences were moved on July 9 from the Staten Island Academy, where they had been stored for the last ten years, to Room 309 in the Richmond Borough Building, which was assigned to the Association last November by the Commissioners of the Sinking Fund. This room, occupying

* Engl. & Prantl, Nat. Pflanzenfam. 3[2]: 192. 1891.

most of the northern frontage on the third floor of the building, is well adapted for museum purposes. It is about 25 by 150 feet, with five large windows situated in shallow alcoves. Admission is gained through three separate entrances from the corridor. The wall-space, except on the north side, is occupied by a row of bookcases five feet in height; these and the rest of the woodwork are of weathered oak in dull finish. The west half of the room, separated by a temporary partition, is now used by draughtsmen attached to the city engineer's office; it is understood, however, that other quarters will be found for these by the time the museum furniture is ready. A partition will then probably be erected at the eastern end, creating a room of sufficient size for administrative purposes and for the accommodation of the herbarium and other collections not on public exhibition.

In botanical material the Association has already an excellent nucleus. Its herbarium, numbering about 3,000 specimens, consists chiefly of local plants, including most of the material, original or in duplicate, on which Britton and Hollick's "Flora of Richmond County" with its subsequent additions, was based. To this will be added as soon as formally turned over to the Association the herbarium of Dr. Arthur Hollick, containing about the same number of specimens, many of them from other parts of the United States. The local material will ultimately be brought together as a separate herbarium, which with the recent collections made on the island by Dr. Philip Dowell and others will afford a very complete representation of the Staten Island Flora, accessible to all students. For exhibition purposes there is already available a good series of nuts, acorns, and other large fruits from Staten Island trees; specimens of bracket fungi; a number of stems showing various forms of fasciation; a few wood specimens; and an excellent series of fossil plants and plant remains. It is planned also to exhibit a collection of the seaweeds of New York harbor, mounted in swinging or in wall frames; series of seeds of native grasses, weeds, etc.; and later, model groups illustrating the ecological features of our flora.

The library of the Association at present includes about two thousand volumes, principally serials received in exchange for

its Proceedings. Among the more valuable complete sets may be mentioned the Bulletin of the Torrey Botanical Club, Science, the American Naturalist, the Report of the Missouri Botanical Garden, the Annals of the New York Academy of Sciences, the Bulletin of the American Museum of Natural History, the Reports of the Smithsonian Institution and of the U. S. Geological Survey, etc. Many of these are not to be found elsewhere on Staten Island.

The library has recently been enriched by a donation of 150 miscellaneous scientific books from Dr. Arthur Hollick, and will also receive as a deposit about the same number of volumes from the library of the curator.

THE BOTANICAL SYMPOSIUM, AT NEWTON, NEW JERSEY

The fourth annual Botanical Symposium was held, as previously announced in Torreya, at Newton, Sussex County, New Jersey, during the week of July 1–7, 1907, with headquarters at the Hotel Waldmere. Beside a few local visitors, there were twenty-five in attendance.

Monday, July 1.— Most of the party arrived on the afternoon of the first day and had time for a short walk in the immediate vicinity, so that at the first meeting, held in the evening, several interesting finds were reported. Limestone ridges running northeast and southwest through the region of Newton afford conditions favorable to the growth of some interesting plants. Among these were noted *Arabis laevigata* (Muhl.) Poir., *Quercus acuminata* (Michx.) Houba, *Asplenium platyneuron* (L.) Oakes, *A. Ruta-muraria* L., *A. Trichomanes* L., *Camptosorus rhizophyllus* (L.) Link, *Filix fragilis* (L.) Underw., *Pellaea atropurpurea* (L.) Link, and *Woodsia obtusa* (Spreng.) Torr. In the swampy ground there were *Alnus incana* (L.) Willd., *Betula pumila* L., *Equisetum fluviatile* L., and *Moehringia lateriflora* (L.) Fenzl. The following were noted as weeds: *Anthemis arvensis* L. (common), *Lepidium apetalum* Willd., *Pentstemon Digitalis* (Sweet) Nutt. (abundant), and *Scrophularia leporella* Bicknell. *Malva*

moschata L. was noted as an escape. Dr. Philip Dowell presided at the evening meeting, which was devoted largely to the reading of the report of the previous year's Symposium, at Mountain Lodge in the Adirondacks, and to various business items. At the request of the permanent recorder, Mr. Joseph Crawford, the report was read by Mr. Lee Sowden. A program committee, consisting of Messrs. Stewardson Brown and B. W. Griffiths, was appointed to plan the excursions and to make the necessary arrangements for each day's trip. Messrs. Lee Sowden and S. Van Pelt were appointed official recorders of the finds reported by members of the Symposium from the vicinity of Newton. Mrs. H. A. DeCoster and Mr. Bayard Long were appointed official photographers.

Tuesday, July 2. — Some of the hill country east and the chain of lakes northeast of Andover Junction were visited. Mr. Brown presided in the evening. The following are some of the plants noted: *Anchistea virginica* (L.) Presl, *Botrychium simplex* E. Hitchcock, *Woodsia Ilvensis* (L.) R. Br., *Achroanthes monophylla* (L.) Greene, *Galeorchis spectabilis* (L.) Rydb., *Leptorchis liliifolia* (L.) Kuntze, *L. Loeselii* (L.) MacM., *Capnoides sempervirens* (L.) Borck., *Pyrola secunda* L., *Ranunculus delphinifolius* Torr., from the hill country east; and from the lake region, *Adlumia fungosa* (Ait.) Greene, *Astragalus carolinianus* L., *Carex Buxbaumii* Wahl., *C. conoidea* Schk., *C. flava* L., *C. granularis* Muhl., *C. lanuginosa* Michx., *C. leptalea* Wahl., *C. longirostris* Torr., *C. riparia* Curtis, *C. tetanica* Schk., *Cornus circinata* L'Her., *C. stolonifera* Michx., *Geum rivale* L., *G. strictum* Ait., *Naumburgia thyrsiflora* (L.) Duby, *Parnassia caroliniana* Michx., *Polygonum amphibium* L.

Wednesday, July 3. — The excursion was to Culver's Lake and Culver's Gap, about twelve or thirteen miles north and west of Newton. Especially interesting was the flora of the mountain at the Gap. Dr. N. L. Britton was chairman at the evening meeting. The following are some of the interesting plants reported from the mountain: *Amelanchier spicata* (Lam.) Dec., *Apocynum Milleri* Britton, *Aralia hispida* Vent., *Azalea canescens* Michx., *Castilleja coccinea* (L.) Spreng., *Polygala polygama* Walt.,

Prunus cuneata Raf., *P. pennsylvanica* L. f., *Ranunculus fascicularis* Muhl. (?), *Sorbus americana* Marsh., *Viburnum pubescens* (Ait.) Pursh. Among other plants noted on the way and in the region about the lake are *Acer spicatum* Lam., *Asclepias verticillata* L., *Blephariglottis grandiflora* (Bigel.) Rydb., *Botrychium neglectum* A. Wood, *Calla palustris* L., *Panicularia Torreyana* (Spreng.) Merr., *Rubus neglectus* Peck, *Salix tristis* Ait., *Utricularia vulgaris* L., *Viola blanda* Willd., *V. Porteriana* Pollard, *V. rotundifolia* Michx. Dr. Britton and others commented on the similarity between the flora of this mountain and other mountains in the region, and comparison was made with the xerophytic vegetation of sandy regions nearer the coast.

Thursday, July 4. — In the morning the region southwest of town was examined, some going beyond Springdale. In the afternoon most of the party visited a tamarack swamp a short distance north. Dr. G. N. Best presided at the evening session, when a number of interesting finds were reported: *Acer nigrum* Michx., *Arabis hirsuta* (L.) Scop., *Arisaema pusillum* (Peck) Nash, *Asplenium ebenoides* R. R. Scott (2 plants beyond Springdale), *Carex cephalophora* Muhl., *C. filiformis* L., *C. laxiflora blanda* (Dewey) Boott, *C. oligocarpa* Schk., *C. xanthocarpa* Bicknell, *Coeloglossum bracteatum* (Willd.) Parl., *Corallorhiza multiflora* Nutt., *Crataegus Porteri* Britton, *Cypripedium hirsutum* Mill., *C. parviflorum* Salisb., *C. reginae* Walt., *Dryopteris Clintoniana* (D. C. Eaton) Dowell, *D. Goldieana* (Hook.) A. Gray, a new *Dryopteris*, two species of *Dudleya*, *Erysimum cheiranthoides* L., *Fraxinus nigra* Marsh., *Hypopitys lanuginosa* (Michx.) Nutt., *Limodorum tuberosum* L., *Lysias Hookeriana* (A. Gray) Rydb., *Meibomia grandiflora* (Walt.) Kuntze, *Melanthium latifolium* Desr., *Mentha aquatica* L., *Menyanthes trifoliata* L., *Myrica Gale* L., *Orontium aquaticum* L., *Picea Mariana* (Mill.) B. S. P., *Pogonia ophioglossoides* (L.) Ker, *Rubus americanus* (Pers.) Britton, *Rumex Britannica* L., *Salix Bebbiana* Sarg., *S. candida* Fluegge, *S. petiolaris* J. E. Smith, *Sarracenia purpurea* L., *Utricularia cornuta* Michx., *U. intermedia* Hayne. An interesting discussion occurred on mutants in connection with *Arisaema pusillum*, in which Dr. Britton, Mr. Brown, Dr. Ida Kellar, and others took part.

Friday, July 5. — The day was spent on a trip to Swartswood Lake. Mr. Joel Carter presided at the evening session. Among the plants reported may be noted the following: *Batrachium longirostre* (Godr.) F. Schultz, *Boltonia asteroides* (L.) L'Hér., *Botrychium neglectum* A. Wood, *Carex setifolia* (Dewey) Britton, *Celtis georgiana* Small, *Conopholis americana* (L. f.) Wallr., *Cypripedium hirsutum* Mill., *Galeorchis spectabilis* (L.) Rydb., *Phegopteris Phegopteris* (L.) Underw., *Salix prinoides* Pursh, *Taraxacum erythrospermum* Andrz. Dr. Britton reported *Polygala paucifolia* Willd., showing good fruit, both aërial and subterranean, also one tree of *Diospyros virginiana* L. and a peculiar form of *Ilex verticillata* (L.) A. Gray (?). The terrestrial form of *Ranunculus delphinifolius* Torr. was observed on the muddy border of a pond.

It is interesting to note the finding of the persimmon in this latitude, and it may be of interest to add that during several years of botanizing around Allentown, Pa., I found just one tree of this plant, and that along the roadside in a similar situation to the one noted by Dr. Britton.

Saturday, July 6. — The day was spent in an all day trip to Round Pond, some thirteen miles west of Newton. This lake is at a considerable elevation, and it was expected that the mountain about the lake would prove to be very interesting botanical ground, as indeed it was. Owing to the time required for traveling by team, however, only a comparatively short time could be devoted to exploration. The higher parts of the mountain were covered with a dense undergrowth. Considerable swampy ground, however, yielded some interesting finds, among which were noted: *Acer carolinianum* Walt., *Achroanthes unifolia* (Michx.) Raf., *Anchistea virginica* (L.) Presl, *Betula alleghaniensis* Britton, *Carex trisperma* Dewey, *Castalia odorata* L. (small form), *Coptis trifolia* (L.) Salisb., *Cornus canadensis* L., a short-leaved form of *Gaylussacia baccata* (Wang.) K. Koch, *Gymnadeniopsis clavellata* (Michx.) Rydb., *Ilex bronxensis* Britton, *I. laevigata* (Pursh) A. Gray, *I. verticillata cyclophylla* Robinson, *Ilicioides mucronata* (L.) Britton, *Kalmia angustifolia* L. and *K. glauca* Ait. (side by side), *Limnanthemum lacunosum* (Vent.) Griseb., *Limodorum tuberosum*

L., *Lobelia Dortmanna* L., *Perularia flava* (L.) Rydb., *Pogonia ophioglossoides* (L.) Ker, *Rhodora canadensis* L., and *Salix sericea* Marsh.

Mr. S. Van Pelt presided over this last meeting, which practically ended the Symposium.

Some of the members had left already and others intended to leave on the following day. Several stayed over until Monday and a few stayed several days longer. Those who remained explored the region about Newton more fully. Among the interesting finds not previously noted are these: *Andromeda Polifolia* L. and *Carex limosa* L. found by Mr. Van Pelt, *Rhamnus alnifolia* L'Hér. by Mr. Long, *Triglochin maritima* L. by Dr. Elsie Kupfer, *Trollius laxus* Salisb. by Prof. C. S. Williamson, *Dryopteris Boottii* (Tuckerm.) Underw., *D. cristata* × *marginalis* Dav., and *Filix bulbifera* (L.) Underw. by the writer.

A great many interesting finds are yet in store for the botanist who has the opportunity of spending more time about Newton, where nature is still quite undisturbed in many places. This applies perhaps as well in the case of the zoölogist, as the many fearless chipmunks and numerous birds and other wild animals testify. Most of us were too much intent upon noting the plants to make records of the wild animals seen, except in the case of the birds. These were noted by Mrs. H. A. DeCoster, who made a list of them.

It is expected that the next Symposium will be held at Townsend, Delaware, or somewhere on the Delaware peninsula.

PHILIP DOWELL.*

REVIEWS

Jost's Lectures on Plant Physiology

The anxiously awaited English edition† of Jost's Vorlesungen über Pflanzenphysiologie has appeared. That Professor Gibson has done admirably as a translator is certain. As the preface ex-

---

* I am indebted to the recorder, Mr. Joseph Crawford, for many of the data given.

† Jost, Ludwig. Lectures on Plant Physiology. Authorized English translation by R. J. Harvey Gibson. 8vo. Pp. i–xiv + 1–564. *f. 1–172.* 1907. Oxford, at the Clarendon Press. Cloth, 21 s., net; half morocco, 24 s., net.

plains, no attempt to "edit" the original has been made and no responsibility is assumed for the treatment of subjects. While this attitude of the translator shows deference to the author it is to be regretted that a work of this character, which will undoubtedly be standard for some time to come, could not have been edited enough at least to avoid the continuance of confusing terminology, some of which was noted by reviewers when the German edition appeared.

In some cases the translator has unfortunately selected words which are not physiologically precise and for which a good equivalent could be used without departing from close translation. For instance, "Stoffaufnahme" is interpreted as "absorption" all through the work. Plants do not absorb substances, they admit them. Admission is certainly as nearly equivalent as "absorption." "Wasserabgabe" is translated "excretion of water," which is physiologically incorrect and inaccurate as translation. In the absence of an exact equivalent, why not use the term, exit of water, when the general passage of water from the plant is intended? Likewise, "Wasseraufnahme" could be translated, admission of water, instead of the absorption of water. The term suction is frequently used instead of the proper usage, negative pressure.

That the translator has exercised commendable discrimination in some cases is apparent in his interpretation of the word "Verwendung." Utilization or appropriation are more nearly equivalent than the word "fate," which the translator has used. Cells do not use nor do they appropriate admitted substances, though material which enters the cell does have a "fate." The same discrimination applied to the phrase, "Verwendung der aufgenommenen Stoffe" would yield "the fate of admitted substances."

Perhaps the most unfortunate confusion of terms and ideas is apparent in the persistent use of assimilation to express the synthesis of complex compounds and the word dissimilation to express the reverse process. When the German edition appeared, Professor Barnes, in his review of the work, called attention to the impropriety of the usage. In an explanatory paragraph on page 103 of this English edition the original author himself con-

cedes the justice of the criticism but offers a rather lame excuse for continuing the usage. Nitrogen assimilation of Jost could easily be the synthesis of nitrogenous compounds; photosynthesis is already restricted to carbohydrate construction in which light energy is needed and by no means covers other syntheses of carbohydrates in which light is not a factor. As Jost says, there is no good reason for treating nitrogen differently from carbon, but there is no more necessity for that than for perpetuating improper terminology "with full cognizance of the difficulties involved in so doing."

To each lecture, as indicated by brackets, there have been added by Jost himself paragraph comments on later work and references to recent literature, so that the English edition is more up to date than the original and those accustomed to always using the German should remember this as well as the fact that Jost himself has made some alterations and corrections.

The typographical work conforms to the standard of the Clarendon Press though the lines are a little too close together.

While the reviewer feels that some of the matters here discussed are important he is equally earnest in saying that the translator deserves abundant credit for the valuable service he has rendered in extending the field of usefulness of such an important work.

RAYMOND H. POND.

Hilgard's Soils *

Dr. Hilgard is undoubtedly the leading authority on soils in America, having studied them critically for over fifty years, under almost every climatic condition that is found in the United States, and at all stages of economic development from primeval forests and deserts to truck-farms and gardens. The volume before us contains the essence of all his previous publications on the subject, and covers the ground very thoroughly, revealing his exten-

* Hilgard, E. W. Soils: their formation, properties, composition, and relations to climate and plant growth in the humid and arid regions. xxvii + 593 pp. 89 figs. New York, Macmillan Co. 1906. (On the back of the title-page is a statement that the book was published in July; but the publishers apparentiy did not begin to advertise it in their own periodical, Science, until September 28, and it was first announced in the New York Times Saturday Review of Books about the same time.)

sive knowledge of meteorology, physics, chemistry, geology, botany, and sociology, and their intimate relations to the main topic. At the same time it is written in a simple and attractive style, and is as free as possible from technicalities. The type, paper, and binding are well chosen, and typographical errors are few.

The main body of the book, exclusive of the very full table of contents, the preface, introduction, three appendices, and two indexes, is divided into four parts, 26 chapters, and 549 pages, including 89 figures, many of which are half-tones. It has already been reviewed appreciatively and at considerable length by a soil expert,* and the present reviewer does not feel qualified to add anything to what has been said about the first three parts, which treat of the origin, physics, and chemistry of soils. Part 4, entitled "Soils and Native Vegetation," which contains brief repetitions of some of the essential features of the three preceding parts, together with much additional matter, will interest botanists most, though the rest of the book contains many botanical references and is well worth studying.

The study of the relations between soil and vegetation has always been one of Dr. Hilgard's specialties. He points out here the difficulty of reaching correct conclusions on this subject in Europe, where most of the soils were cultivated and fertilized for generations before botany became a science, and deplores the scarcity of accurate observations in America, where the character of the original vegetation is known by tradition nearly everywhere where it does not still exist. His view, as expressed in the preface and two or three other places in the book, as well as in some earlier publications, is that "the native vegetation represents, within the climatic limits of the regional flora, the result of a secular process of adaptation of plants to climates and soils, by natural selection and the survival of the fittest. The natural floras and sylvas are thus the expression of secular, or rather millennial experience, which if rightly interpreted must convey to the cultivator of the soil the same information that otherwise he must acquire by long and costly personal experience." In this

* F. H. King in Science II. 24: 681–684. 30 N 1906.

field of research Dr. Hilgard modestly credits Owen and Peter with being the pioneers in this country, but his own splendid "Report on the Geology and Agriculture of Mississippi" (printed in 1860, but unfortunately not generally distributed until several years later *) is far ahead of anything previously published in that line. It is undoubtedly the first work in which the floristic differences between the several longitudinal subdivisions of the coastal plain † are clearly pointed out, and it remains to the present day the most complete description of the vegetation (as well as of the geology) of Mississippi ever published.‡

In the new book, as in some of his previous publications, the author lays stress upon the principle that in regions of ample rainfall, like the Eastern United States, variation in the amount of lime in the soil is one of the chief causes of local diversity of vegetation; while in arid regions, where nearly all soils are calcareous, the effect of moisture is more conspicuous. This perhaps explains why most of the studies of the relations between geology and vegetation hitherto made in this country have been in the East, while ecologists living on the Plains are inclined to regard water-content of the soil as all-important.

The first chapter of part 4 is practically a condensation and revision of the author's observations in Mississippi previously published in the 1860 report just mentioned and in the fifth volume of the Tenth Census twenty-four years later. Regarding vegetation as essentially stationary, he points out the striking differences between the natural growths on calcareous and non-

---

*See Am. Jour. Sci. II. 32: 303. 1861; Tenth Census U. S. 5: 67, 201. 1884; Am. Geol. 27: 284–311. 1901; Bull. U. S. Geol. Surv. 283: 5, 6. 1906.

† In this connection it is noteworthy that the term "coastal plain" did not appear in strictly botanical literature until ten or twelve years ago, and even yet many American botanists do not realize its significance, and still more probably regard that province as essentially a homogeneous one.

‡ It was under his leadership that the two splendid volumes on cotton production of the southern states and California were prepared for the Tenth Census. On account of their too modest title these volumes have never received the recognition from scientists (except perhaps from geologists) that they deserve; but they are remarkable for their accuracy and completeness, and show in a most convincing manner how the local distribution of forests, crops, and population in the Southeast depends mainly on soil, rather than on temperature, latitute, altitude, or drainage basins, as some writers in the North have assumed.

calcareous, clayey and sandy, sour and neutral soils, etc. Instead of ambiguous statements that certain soils are characterized by "pines," "oaks," "bays," "gums," and the like, such as one commonly finds in soil-survey reports and other publications of similar nature, Dr. Hilgard mentions particular species, not only of trees but smaller plants, and in several cases different forms of the same species.*

A significant point which he makes (p. 495) is that the "calcifuge" plants of pine meadows have as a rule very small seeds. It would be interesting to determine how far this correlation holds with bog-plants in other parts of the world, and with plants of other habitats.

The second chapter of part 4 deals with the relations of soils to vegetation in other states of the Union and in Europe, as observed by the author and a few others who have given attention to the same problems. The statement on page 518 that "*Aster Novae-Angliae* serves as a reliable guide to high-class lands in the Middle West," when it is well known that this same handsome and easily recognizable species is a common roadside and pasture weed in the washed gravelly soils of New England, is interesting. Has this species perhaps come into New England from the West in historic times, as many other weeds have done, or are the

---

*It is indeed difficult (though perhaps not impossible, as some would have us believe) to draw a sharp line between variations which are due directly and solely to differences in environment, and distinct species which cannot be merged into each other. Dr. Hilgard places in the former class a few pairs of species which were not distinguished by botanists at the time he knew them in the field, but have since stood the test of cultivation side by side, and have been proved distinct by the discovery of additional characters, as well as by their respective ranges. Such pairs are *Pinus palustris* and *P. Elliottii* (p. 494), *Taxodium distichum* and *T. imbricarium* (p. 494), and probably *Quercus Phellos* and *Q. laurifolia* (pp. 502, 507). It is scarcely necessary to add that most modern species-makers are inclined to err in the other direction.

The different forms of post-oaks and black-jacks figured on pages 500 and 501 are indeed remarkable; and without having seen the originals it would be hazardous to express any opinion on them. The post-oak (*Quercus minor*) has been split up by recent writers into three or four supposed distinct species, some of which may correspond with some of Dr. Hilgard's figures; but no subspecies or varieties seem to be recorded for the black-jack (*Quercus marylandica*), which Dr. Hilgard finds equally variable. Further study of these forms in the field would be interesting.

eastern and western plants different species? Or is this a problem for the ecologist rather than for the systematist?

In discussing some of the phytogeographical phenomena of Europe Dr. Hilgard comments on the physical and chemical theories of soil influences, and the classification of plants as "calciphile," "calcifuge," "silicophile," etc., and reviews the work of Thurmann, Fliche, Grandeau, Bonnier, Contejean, A. F. W. Schimper, Wahlenberg, and others. He also emphasizes the great predominance of calcareous soils in Europe as compared with America, a fact which is often overlooked by ecologists and agricultural scientists when making use of European literature. Another important point is that the definition of calcareous soils differs considerably in the two continents. In Europe a soil is not usually called calcareous unless it effervesces with acids, which requires 4 or 5 per cent. of calcium carbonate, while in the United States many soils bearing characteristic "lime vegetation" contain less than 1 per cent. of the same mineral.

The last chapter, on the vegetation of saline and alkali lands, is based on some of the author's latest work in California. It contains illustrations of several of the characteristic alkali plants, with some anatomical and physiological notes, and statistics of the maximum, minimum, and optimum amounts of the various alkalies in the soil for each species.

The three short appendices deal with simple methods of soil examination. The subject index is as complete as could be reasonably desired, and in place of a regular bibliography there is an index of the names of authors whose works are referred to in the text.* Among about 185 such names botanists will be interested to see those of Coville, Darwin, Haberlandt, Kearney, Kuntze, Mohr, G. T. Moore, W. J. V. Osterhout, and J. W. Toumey, besides those mentioned above.

If space would permit, a great deal more might be written about this book, which must be seen to be appreciated. It will be very

* Dr. Hilgard does not attempt to list his own writings on the subject, but the following references will be instructive to the reader who wishes to become more familiar with his views: Science 11: 241, 242. 1888; Overland Monthly, D 1891; Science II. 18: 755–760. D 1903; 19: 233, 234. 5 F 1904; 20: 605–608. 4 N 1904; 23: 70, 71. 12 Ja 1906.

useful to all persons who are interested in the study of plant environments, especially to those who have not access to the author's Mississippi reports above mentioned; and it should stimulate the investigation of a branch of phytogeography which has received entirely too little attention in America.

Roland M. Harper.

NEWS ITEMS

According to a recent number of *Science*, Dr. M. A. Chrysler of Harvard University has accepted a position as associate professor of botany in the University of Maine.

Mr. Homer D. House has resigned the associate professorship of botany and bacteriology in Clemson College, South Carolina. He plans to spend the coming year at the New York Botanical Garden.

Dr. William L. Bray has resigned the professorship of botany in the University of Texas in order to accept the professorship of botany in Syracuse University, recently vacated by Dr. J. E. Kirkwood.

Dr. W. C. Coker, associate professor of botany in the University of North Carolina, spent a considerable part of July in studies at the New York Botanical Garden. He sailed from New York on August 3 for a visit to Porto Rico.

Professor F. S. Earle, recently director of the Cuban Agricultural Experiment Station, has been at the New York Botanical Garden for several weeks, continuing his studies of the gill-fungi. He sailed from New York for Cuba on August 10.

Dr. E. N. Transeau, who for the past year has been an investigator at the Carnegie Station for Experimental Evolution at Cold Spring Harbor, Long Island, N. Y., has accepted an appointment as professor of botany in the State Normal School at Charleston, Illinois.

Miss Winfred J. Robinson, instructor in botany in Vassar College, has a year's leave of absence, which she will devote to studies at the New York Botanical Garden. Miss Helen L. Pal-

liser will have charge of the botanical courses in Vassar during the coming year.

We note with regret the death of a former member of the Club, Mr. Samuel Henshaw, which occurred at West New Brighton, Staten Island, on July 22. Mr. Henshaw was head gardener of the New York Botanical Garden from the beginning of its active development in 1896 to 1901.

Mr. Edward W. Berry, of the Johns Hopkins University, is spending two months in a field study of the Mesozoic deposits of Virginia, North Carolina, and South Carolina. Important plant-bearing beds have already been discovered in several localities in North Carolina and in one locality in South Carolina.

The thirteenth annual field meeting of the Vermont Botanical Club was held in Pownal, Vermont, July 2 and 3, 1907. About forty persons were in attendance, including several members of the Connecticut Botanical Club. Tuesday, July 2, was devoted to exploring the limestone cliffs at North Pownal, under the guidance of Mr. W. W. Eggleston, while Wednesday, the 3d, was spent in visiting the bogs of the central and eastern parts of the town, Miss Grace Greylock Niles, author of "Bog-trotting for Orchids," acting as guide.

Professor Francis E. Lloyd, formerly of the Teachers College, Columbia University, and more recently connected with the Desert Botanical Laboratory of the Carnegie Institution, has accepted a position as botanical expert with the Continental Rubber Company of America, which owns very extensive tracts of land in central Mexico and has its headquarters in New York City. Dr. J. E. Kirkwood has resigned his professorship of botany in Syracuse University in order to assist Professor Lloyd in this new work, which they have already begun. The main plant of the company is located at Torreon, State of Coahuila, and it is understood that the "guayule," a composite of the genus *Parthenium*, is the source of the rubber obtained. The present address of Professors Lloyd and Kirkwood is Hacienda de Cedros, Mazapil, Zacatecas, Mexico.

Vol. 7 September, 1907 No. 9

TORREYA

A Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE AND PHILIP DOWELL

JOHN TORREY, 1796–1873

CONTENTS

Published for the Club
At 41 North Queen Street, Lancaster, Pa.
by The New Era Printing Company

[Entered at the Post Office at Lancaster, Pa., as second-class matter]

THE TORREY BOTANICAL CLUB

Torreya is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, fifteen cents. To subscribers elsewhere, five shillings, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to Treasurer, Torrey Botanical Club, 41 North Queen St., Lancaster, Pa., or Columbia University, New York City.

Matter for publication should be addressed to

Marshall A. Howe
New York Botanical Garden
Bronx Park, New York City

Vol. 7. No. 9.

TORREYA

September, 1907

THE DATES OF RAFINESQUE'S NEW FLORA AND FLORA TELLURIANA

By John Hendley Barnhart

As far as I am aware, no question has ever been raised concerning the reliability of the dates given on the title-pages of any of the works of Rafinesque. His Autikon Botanikon, to be sure, is dated 1815–1840, while no portion of the text was published until 1840; but this text was intended to illustrate an herbarium which the author had accumulated during the years 1815–1840, so that the meaning of the date he gives is manifest.

About a year ago I noticed in the Flora Telluriana (4: 27) a brief criticism of Gray's monograph of the Melanthaceae of North America, which was not published until November, 1837;* and this, of course, showed that Rafinesque's criticism could not have been published earlier than that date. A hurried examination revealed further internal evidence of the erroneous dating of the Flora Telluriana and its companion-work, the New Flora of North America, but the investigation of the subject was not carried very far at that time.

When the last number of the North American Flora was in press, it became necessary for Dr. Small to decide upon the relative priority of *Mesynium* Raf. ("1836") and *Cathartolinum* Reichenb. (1837), and this led to the study of which the results are here reported.

The New Flora of North America was undertaken by Rafinesque as a supplement to the works previously published by others upon the same topic; and as a result of his labors upon

* Gray, A. Melanthacearum Americae Septentrionalis Revisio. Ann. Lyc. Nat. Hist. N. Y. 4: 105–140. N 1837.

[No. 8, Vol. 7, of Torreya, comprising pages 157–176, was issued August 21, 1907.]

it, he was led to undertake the preparation of its "sequel," the Flora Telluriana, dealing with the plants of the rest of the world. The pages of these two works contain many descriptions of "new genera" of plants, so that the dates of their appearance are of considerable importance. As the books themselves are quite scarce, a brief preliminary account of them may not be out of place.

Each was planned to consist of six "parts" or volumes, but was completed in four. Each of the eight parts is separately paged, and has a separate title-page and subtitle of its own; and each is dated "1836."

New Flora and Botany of North America

First part. Introduction, Lexicon, Monographs. 100 pages. 1836.

Second part. Neophyton. 96 pages. 1836.

Third part. New Sylva. 96 pages. 1836.

Fourth part. Neobotanon. 112 pages. 1836. (This contained also a general title-page for the entire work, dated 1836.)

Flora Telluriana

First part. Introduction and Classification. 103 pages. 1836.

Second part. Centuria I, II, III, IV. 112 pages. 1836.

Third part. Centuries V, VI, VII, VIII. 100 pages. 1836.

Fourth part. Centuries IX, X, XI, XII. 135 pages. 1836. (This contained also a general title-page for the entire work dated 1836.)

Of these eight parts, the first part of the New Flora was the first to appear. It contained a dedication dated at Philadelphia, September, 1836; and pages 73–80 are occupied by a monograph of the genus *Kuhnia*, dated October, 1836. These facts alone are sufficient to make one suspect that perhaps the eight parts were not all issued before the end of that year! There is not lacking other internal evidence on this subject, in addition to the citation of Gray's monograph (Fl. Tell. 4: 27; also New Fl. 4: 103, where the date of "Grey's" paper is distinctly stated as "1837"). Flora Telluriana, part 3 (which in turn is cited by

New Fl. 3 : 41, 51), on page 57 refers to Bot. Reg. *pl. 1906* (1 N 1836 !); and on page 37 to Bot. Mag. *pl. 3540* (1 D 1836 !), which could not well have reached Philadelphia before the end of the year 1836. Flora Telluriana, part 4 (which in turn is cited by New Fl. 4 : 56, 57, 63, 98), on page 124 cites Bot. Reg. *pl. 1958* (1 My 1837). But, in spite of these references, I know of no *internal* evidence that the two works were not completed before the end of the year 1837.

From internal evidence, too, it is possible to arrange the parts serially, in the order in which they were printed. This may be done by means of the exact citations, by page, of one work by the other; chiefly of the Flora Telluriana by the New Flora. The result is as follows : New Fl. I ; Fl. Tell. I ; Fl. Tell. II ; New Fl. II ; Fl. Tell. III ; New Fl. III ; Fl. Tell. IV ; New Fl. IV.

In order to approximate more closely than might otherwise be possible the exact dates of issue of each of these parts, the series of letters written to Torrey by Rafinesque during the years 1836 to 1839, and preserved in the Torrey correspondence at the New York Botanical Garden, was searched, and the search was well rewarded, as is shown by the following quotations :

September 5, 1836.—"I having leisure have resolved to begin to print my New flora of North Amer. by alphabetical order. . . . When this Work is printed, my botanical labors from 1802 to 1836, in America, will be better known."

December 21, 1836. — "My flora proceeds very slowly & was even suspended awhile for lack of a compositor that could print Botanical terms ! . . . I have concluded to close the Lexicon of monographs very abruptly, and give instead selected monographs & my N. Genera & species."

This shows that only ten days before the close of the year 1836 even the printing of the first part of the New Flora was not completed.

April 18, 1837. — "I wanted to surprise you with a great Botanical Work — my Flora telluriana . . . to which I was led by my New flora of N. Amer., but I could only print 2 parts or volumes. I. Classes & Orders. 2d. 400 N. Gen. my other engagts have compelled me to suspend for a while."

By the middle of April, 1837, then, had been printed one part of the New Flora and two of the Flora Telluriana.

October 24, 1837. — "I am still going on slowly with my New flora of N. America and Flora telluriana at once. . . . I have circulated but few copies of the numbers published, wishing to surprise you and all Botanists when the whole shall be out; but if you wish to see them earlier I may send you 5 numbers of 100 pages 8vo each very soon, and more next March."

From this it appears likely that a second number of the New Flora had appeared when this letter was written, and that a third number of the Flora Telluriana was nearly ready; or else that the two parts were nearly ready to be issued together.

January 10, 1838. — "My New flora or Mantissa begun to print in 1836 is still going on & altho' interrupted by my flora Telluriana & 2 works published this Spring (1. The Universe. — 2. Safe Banking) is proceeding as fast as correct exam. can allow. I wished to issue the whole work together; but I shall be compelled to issue when half is ready 3 numbers of 100 pages as in Flora tellur. My 3d N. on the Trees and Shrubs or a New sylva is not quite ready."

At the end of 1837, then, three numbers of the Flora Telluriana had been issued, and two of the New Flora, but on January 10, 1838, the third part of the New Flora was "not quite ready."

March 20, 1838. — "I have long ago concluded 600 pages of my Supplemental Flora & Flora Telluriana or 6 parts. If I had not undertaken these 2 works together, the first would have been completed ere now, but will be ere 1840."

The third part of the New Flora had evidently been published since the date of the January letter. It appears that Rafinesque still intended each work to consist of six parts, and for this reason allowed himself until 1840 to complete them.

February 1, 1839. — "My 4th part or Volume of New flora was completed so as to give you time to go on with your flora. I also completed my Flora telluriana in 4 Vol. or 1225 articles. But immed^{y} after begun & have concluded last Dec^{r} my Synopsis of N. G. & Sp. of Trees & Shrubs of N. Amer."

From this it appears that prior to December, 1838, both the

Flora Telluriana and the New Flora had been completed. The last sentence refers to Rafinesque's Alsographia Americana, which was dated 1838, and from his own statement above was probably issued in December of that year.

The extracts from Rafinesque's letters show that few, if indeed any, copies of either the Flora Telluriana or the New Flora had been actually distributed until three parts of each had been printed (in the spring of 1838); but, as he says in the letter of October 24, 1837, "I have circulated but few copies of the numbers published," we must give him the benefit of the doubt, and assume that he had distributed a few copies.

Rafinesque's Bulletin of the Historical and Natural Sciences was an advertising sheet issued by him at irregular intervals from 1834 to 1839. No. 7, dated "Spring of 1838," is devoted chiefly to the two works here under discussion. He says in part: "I had long contemplated to give a New Flora of North America. . . . I resolved . . . to add the improvements on Natural classification. These last, however, increased so much under my revision, as to become a work by itself, and a companion rather than addition to our Flora. Both works were begun in 1836, and our plants would all have been published by this time, if I had not thus been compelled to double these botanical labors. I once proposed to issue the whole at once when completed, but this delay and others arising from different pursuits and labors, have induced me to publish the parts as soon as printed, and now that 3 parts of each (being half a volume,) are published, I issue this Bulletin to acquaint the Botanists of Europe and America with" them. "Each work is to consist of 6 parts of 100 to 120 pages, thus forming a volume large octavo of 600 to 700 pages, which shall be completed in 1840 or sooner. . . . The 6 parts now printed, 3 of each work, will be sold together for $5."

The dates of the two works under discussion, as nearly as they can be determined from the evidence here submitted, may be summarized as follows:

New Flora	Part I.	1836 (December).
	II.	1837 (second half).
	III.	1838 (first quarter).
	IV.	1838 (late in year).

FLORA TELLURIANA. Part I. 1837 (first quarter).
II. 1837 (first quarter).
III. 1837 (November or December).
IV. 1838 (near middle of year).

NEW YORK BOTANICAL GARDEN.

DESCRIPTION OF A NEW TERTIARY FOSSIL FLOWER FROM FLORISSANT, COLORADO

BY ARTHUR HOLLICK

Among the many interesting specimens discovered by Professor Theo. D. A. Cockerell in the Tertiary plant beds at Florissant, Colorado, recently transmitted to me for critical examination, is one which represents a more or less well-preserved flower. Some of its parts are obscure or missing, but those that are preserved show the general characters of the filaments, anthers, and petals, and, to a lesser extent, those of the calyx also.

FIG. 1. Photograph of *Phenanthera petalifera*, 1½ times natural size.

It is so seldom that the delicate tissues of petals, filaments and anthers are preserved as fossils, and the known examples of any such are so few, that this specimen is of unusual interest and is worthy of description even though the description must necessarily be incomplete.

Phenanthera petalifera gen. et sp. nov.

Remains consisting of more or less dismembered parts of a small pedunculate, choripetalous flower, which may be allied either to the family Caryophyllaceae or to the order Rosales or to the Myrtales.

Calyx-tube about 4 mm. wide and 5 mm. long, urn-shaped, 4 (?)-divided above the middle, the divisions bearing spatulate appendages (?). Petals spatulate, 2–3 times longer than the divisions of the calyx-tube and alternate with them. Stamens 8,

exserted beyond the calyx, about one-half as long as the petals. Anthers relatively large, oblong-ovate, 2-lobed.

This description indicates the appearance which the remains present in this particular specimen, and it may or may not correctly describe the flower as it was originally. Where the parts are crushed together the order of superposition cannot be determined, so that the definition of the parts and their relative positions as indicated in the figures may represent merely present appearances and not the original conditions.

Apparently it was a 4-merous flower with 8 stamens, and there is an indication of what may be a portion of a style, or perhaps a broken filament, extruding from between two of the anthers.

FIG. 2. *Phenanthera petalifera*, enlarged about 7½ diameters.

The peculiar spatulate appendages which are questionably regarded as attached to the divisions of the calyx-tube, may perhaps represent the tips of these divisions and not separate organs, or they may be expanded filaments. There is one almost perfect petal, shown on the right hand side of the figures, while on the

left there is another, evidently imperfect and apparently partly superimposed upon the remains of a third one belonging to the opposite (under) side of the specimen. If a fourth one was present it is not now apparent.

New York Botanical Garden.

AN ABNORMAL LEAF IN RUMEX

By S. B. Parish.

The accompanying figure represents an abnormal leaf of *Rumex hymenosepalus*, having two blades. The superior blade stands more vertically erect than the lower, it is shorter and more crisped, but in other respects the two are alike. Along the midrib the bases of the blades are separated by an interval of about three millimeters. Two adjacent plants were seen, each having fully half of its leaves affected in this manner, but not all to so great an extent as the one figured. On some the secondary blade was present but as a fragment, of greater or less size, or two or three separated fragments. These might occur at any point along the midrib, from its base nearly to its apex, but always of the form and size which the blade would there have presented, had it been continuous. And in every case, even when most fragmentary, the secondary blades were produced on both sides of the midrib.

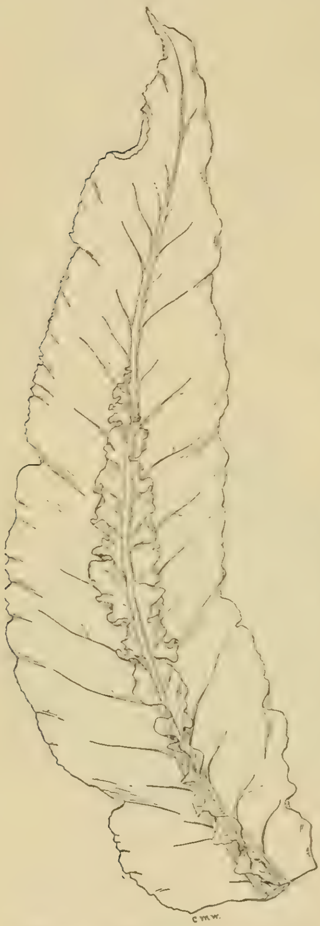

Fig. 3. Abnormal leaf of *Rumex hymenosepalus*, about ⅓ natural size.

It is possible to regard this teratological condition as an instance of foliar peloria. But to this view there are two objections.

The abnormal blades, or fragments of blades, appeared to have originated at the earliest stage of leaf-formation, rather than to have been outgrowths at a later period. Furthermore, a decided disarrangement of the fibrovascular bundles of the midrib suggests a different explanation. Such a condition might result from the cohesion, or rather fusion, of the midribs of two leaves, one superimposed upon the other, the blade of the uppermost being either reduced or fragmentary. But to whatever cause this malformation was due, it is probably one of infrequent occurrence, since none of a like nature is recorded by Masters.

San Bernardino, California.

SHORTER NOTES

A new Mikania from Cuba. — **Mikania alba** sp. nov. Glabrous, except the involucral bracts. Primary branches round, striate, secondary ones hexagonal, canaliculate: petioles 4–6 mm. long, slightly winged; leaf-blades coriaceous, lanceolate-ovate, obtuse at the apex, rounded or obscurely cordate at the base, 4–5.5 cm. long, 1.6–1.8 cm. broad, diminishing in the inflorescence to linear or subulate bracts, three-nerved, the nerves deeply impressed in the reticulate-rugose upper side, prominent on the lower, the margin conspicuously revolute: inflorescence bracted, paniculate, ultimately composed of opposite, widely divaricate racemes, with a terminal one; racemes with 8–24 heads; heads opposite below, alternate above, pedicelled, subtended by a subulate bractlet much exceeding the pedicel; involucral bracts oblong-lanceolate, obtuse, 5–6 mm. long, brownish at the center, becoming transparent towards the ciliate margin, as long as or slightly shorter than the corolla; pappus white, equalling the corolla or nearly so, armed with minute spinules; corolla white, tubular-campanulate, scarcely longer than the involucral bracts, with oblong-lanceolate, acute lobes, thrice shorter than the tube, or less; stamens as long as the corolla, rarely exserted, with cylindric anthers; style-branches widely divaricate, subsequently recurved-coiling, finely tuberculate: achenes glabrous.

Collected in the Sierra Maestra, at an elevation of 3,400 feet, on Jiquarito Mountain, Sevilla Estate, province of Santiago, Cuba, by the writer on September 18, 1906; *no. 516* (type), in herb. New York Botanical Garden.

From a study of the recent monograph of the West Indian species,* we find that the plants most nearly related to *Mikania alba* are evidently *M. papillosa* Klatt of Hispaniola and *M. Swartziana* Griseb. of eastern Cuba.

From the former the new plant presents marked differences in the stem, which is angled in *papillosa*, round in *alba;* in having entire, not lobed leaves as in the Hispaniola plant, and in having a reticulate-rugose instead of a nearly smooth surface as in *papillosa.* The inflorescence in *alba* is paniculate-racemose; in *papillosa*, axillary, solitary, or sometimes a simple raceme. The corolla of the new plant is white, in *papillosa* it is yellow.

The differences between *Swartziana* and *alba* are chiefly in the lanceolate-ovate, not ovate leaves. The pappus of the new plant is scarcely longer than the involucral bracts, in *Swartziana* it is conspicuously so. The corolla lobes in *alba* are thrice shorter than the tube, in *Swartziana* "lobis breviter oblongis erectis tubo toto 5–6plo brevioribus."

The new plant differs from both the older ones in having a subtending bractlet that much exceeds the pedicel.

Norman Taylor

New York Botanical Garden.

REVIEWS

DeVries' Plant Breeding †

This work will be eagerly read by the scientific world and the general public because of the remarkable achievements of Nilsson (made public now for the first time) and also for the impartial and appreciative account of Burbank's work. No less important is the discussion of the principles that underlie plant breeding.

In 1901 Nilsson became director of a private company that had been established in 1886 for the improvement of various agricultural crops in Sweden that were slowly but manifestly de-

* Urban, I. Symbolae Antillanae seu fundamenta Florae Indiae Occidentalis. 5: 212. 1907.

† DeVries, Hugo. Plant Breeding. Comments on the experiments of Nilsson and Burbank. 8vo. vi + 360. *f. 1–114*. The Open Court Publishing Company. Chicago and London. 1907.

teriorating and so lessening the value of harvests. It soon became manifest that the German method of ameliorating a given variety of grain by multiple selection was a failure and that any success was very exceptional, in fact a mere matter of chance. Nilsson brought to the solution of the problem a full knowledge of the laws of variability and inheritance and early in his work made the remarkable discovery that each of the so-called varieties of agricultural crops was in reality made up of a great series of distinct strains or elementary species. The number of these elementary species is surprising ; for example, in the common peas 500 distinct forms have been separated and each variety of the cereals is composed of several hundred forms. More remarkable still is the degree of variation among these elementary species, which far exceeded all the expectations based upon their divergencies when first selected. In fact it was found that when these elementary forms were isolated and bred that they produced offspring so divergent in morphological characters and qualities as to meet practically any demand that the farmers required. Some were suitable for light soils, others for heavy ; some were early and others late in ripening. They differed in stiffness of culms, length of ears, size and number of grains, etc. This discovery revolutionizes the common method of plant breeding. All success depends upon the initial selection of a pure strain. Manifestly the old multiple selection must result in the association of several strains — some being poor or indifferent — with the result that the offspring will be a mixture and fall short of a high standard. These early experiments demonstrated that the plant develops according to its inherent nature and that it can not be made to conform to a desired pattern. So the old idea of ameliorating a crop by repeated selections must be abandoned. A single initial selection is the important point.

Not less important from a practical standpoint was the work of Nilsson in studying the relation or correlation between the botanical characters of the elementary species and their agricultural qualities. No sooner was it discovered that the elementary species are so divergent as to meet almost any demand of the breeder than the need of a system was felt whereby the desired

quality could be recognized by external characters. This led to an elaborate study of all the traits and qualities of numerous crops with the result that slowly a system has been established for many of the grains, peas, vetches, etc., by which definite qualities can be recognized from a study of their morphological characters. The results of this work in the rapid improvement of crops can scarcely be estimated. Success is now obtained in a few years with a directness and certainty that was impossible by the old method after twenty years of work.

Naturally de Vries makes full use of this work in fortifying his mutation theory, and it will be conceded that his present discussion comes nearer to placing his theory upon an incontrovertible basis than do any of his other writings. It would appear that in order to establish his thesis it now remains for him to show only that the continuous variations of his mutants do not overlap those of the parents.

While much that is misleading has been published about Burbank, sufficiently accurate statements have been made to render his achievements familiar to all. Even his most misguided friends will recognize the scientific and appreciative consideration that is given to Burbank's work. Burbank is an idealist. While interested in the scientific aspects of horticulture he is primarily desirous of giving to his fellow men better foods and fruits and more attractive flowers, and in the cheapest form in order to dispense their enjoyment as widely as possible. No better measure of the man could be given than his dream of a spineless cactus that by its adaptability to arid regions and its edible qualities would make possible the doubling of the population of the world.

Burbank's work is prosecuted on lines quite distinct from those of the Swedish company. He is little concerned with the improvement of a race or elementary species. His results are largely gained by hybridizing. In this work he is guided by two principles that are not generally tried by other breeders. He does not rely upon the association of a few qualities in his hybrids, but all the desirable traits possible are added at once for the purpose of producing a chaos of forms from which valuable selections may be made. Thus in the California lily, *Lilium pardali-*

num, many of the known lilies of the world have contributed their peculiarities to the enrichment of the native form. Secondly, Burbank makes a study of the characteristics and qualities of his plants in all stages of their development, and this knowledge enables him to introduce promising traits and secure more desirable and direct results than other breeders.

It is popularly believed that these improved forms are new creations. Hybridizing only introduces a new combination of characters. No new ones are added. Every novelty has its basis in some previously existing form. Thus, his stoneless prune was derived from a worthless French variety, *prune sans noyau*, by adding this trait to a cultivated form.

Mention only can be made of other important features of the book. An excellent résumé of the mutation theory is presented in the introduction and a very important chapter to American farmers appears in the discussion of the methods that should be followed in corn breeding. With a crop yielding last year 2700 million bushels, valued at over a billion dollars, it will come with something of surprise to learn that little in the way of systematic breeding was attempted until ten years ago ; and we infer that the best work remains to be undertaken.

The closing chapter on the geographical distribution of plants contains several discussions that will be taken with reservations by many. As especially timely may be mentioned his characterization of many of the speculations upon adaptations as merely "poetical descriptions of the way in which we should like to understand and admire nature, but not facts capable of direct proof." In this connection we cannot refrain from mentioning with some amusement (and we are sure Professor deVries will join us) that even the most careful may fall into errors of this nature, as when the author refers to plants maintaining a position of safety on the mountain tops through "dread of their enemies in the valley," (p. 340) and to plants "seeking conditions" (p. 335).

The work of Nilsson and his colaborers has heretofore been almost entirely concealed from the public owing to the fact that the aim of the company has been neither educational nor directed primarily to scientific researches. Its sole object has been the

amelioration of agricultural crops. In presenting this scientific discussion of plant breeding, Professor deVries has given us one of the most valuable contributions to botanical science in recent years.

Carlton C. Curtis.

Columbia University.

NEWS ITEMS

Dr. Heinrich Hasselbring, assistant in botany in the University of Chicago, has been appointed assistant botanist at the Cuban Agricultural Experiment Station, at Santiago de las Vegas.

Dr. C. B. Robinson, assistant curator, New York Botanical Garden, spent two or three weeks of his summer vacation in making collections at the Bay of Seven Islands, Saguenay, Quebec.

Mr. Elmer D. Merrill, botanist of the Bureau of Science of the Government of the Philippine Islands, has recently devoted a week to studies in the herbarium and library of the New York Botanical Garden.

Mr. Allen H. Curtiss, well known as a collector and student of the plants of the southern United States and of the West Indies, died in Jacksonville, Florida, on September 1, in the sixty-third year of his age.

Dr. and Mrs. N. L. Britton are spending the month of September on the island of Jamaica. It is expected that the southwestern part of the island, where comparatively little botanical collecting has been done, will receive a large share of their attention at this time.

A "readership" in forestry has been established in Cambridge University and the appointment to the new position has been awarded to Dr. Augustine Henry, who is especially well known to botanists by his collections in China and Formosa. Dr. Henry visited the United States and Canada last autumn for the purpose, chiefly, of studying forestry conditions.

Dr. Carl Skottsberg, who was a member of the Swedish Antarctic Expedition of 1901–'03 and has since been engaged in studying his collections of the marine vegetation of that region,

will lead a new scientific expedition to the Falkland Islands and Tierra del Fuego. It is planned to leave Göteborg during the present month and to return to Sweden in April or May, 1909.

Dr. H. H. Rusby, dean of the College of Pharmacy of Columbia University and president of the Torrey Botanical Club, was elected second vice-president of the American Pharmaceutical Association at the meeting held in New York City during the first week in September. Dr. Rusby has recently received an appointment as an official expert in drug products to the Bureau of Chemistry, U. S. Department of Agriculture.

The interesting and important paper entitled "Contributions to the History of American Geology" published last year by Dr. George P. Merrill, head curator of geology, U. S. National Museum, in the Annual Report of the Smithsonian Institution for 1904, includes in an appendix, among biographical sketches of the principal workers in American geology, brief accounts of the lives of many who contributed also to the early progress of botany in America. Among such pioneers, sketches are given of Lewis C. Beck, W. H. Brewer, Samuel B. Buckley, Chester Dewey, Amos Eaton, Ebenzer Emmons, George Engelmann, F. V. Hayden, Edward Hitchcock, Joseph LeConte, Leo Lesquereux, Elisha Mitchell, Samuel Latham Mitchill, J. S. Newberry, Robert Peter, J. E. Teschemacher, and F. A. Wislizenus.

An appreciative article on "The Botanical Garden, New York," containing a considerable amount of rather naïve misinformation, is published in *The Gardener's Chronicle* of London for August 24, 1907, *Die Gartenwelt* of July 20 being made responsible for the particulars. The article begins as follows:

"An idea of the enormous growth of New York, the second largest city in the world, with its 4,000,000 of inhabitants is obtained from the Bronx suburb, which is readily reached by two elevated railways and lies to the north of the city. This terrain, 20 years ago, was as difficult to reach as Philadelphia, and possessed a population of about 30,000 persons, distributed over an area of 917 square miles.* There were but few good houses,

* [The area of the Borough of the Bronx is given in the World Almanac as 40.65 square miles and its population in 1880 as 51,980, in 1890 as 88,908. — Ed.]

and these chiefly summer villas scattered about in a wilderness of luxuriant-growing deciduous trees. The rest were huts inhabited chiefly by criminals. To-day, the Bronx is one of the finest parts of New York, and the inhabitants number 400,000. Its most noteworthy feature is Bronx Park, which nature and art have united in forming into a charming idyll for the lover of nature."

Among the botanical visitors in New York City during the past summer, in addition to those already noted in TORREYA, may be mentioned the following: W. H. Lipsky, St. Petersburg; Professor F. L. Stevens, North Carolina Agricultural and Mechanical College, West Raleigh, N. C.; Professor M. A. Barber, University of Kansas, Lawrence, Kansas; Professor F. E. Lloyd, Mazapil, Zacatecas, Mexico; Professor William L. Bray, Syracuse University, Syracuse, N. Y.; Professor Douglas H. Campbell, Stanford University, California; Mr. William R. Maxon, U. S. National Museum, Washington, D. C.; Professor T. D. A. Cockerell, University of Colorado, Boulder, Colorado; Dr. H. N. Whitford, Forestry Bureau, Manila, P. I.; Dr. Clifton D. Howe, Biltmore Forest School, Biltmore, North Carolina; Dr. D. T. MacDougal, Carnegie Institution, Washington, D. C.; Professor D. S. Johnson, Johns Hopkins University, Baltimore, Md.; Professor John L. Sheldon, West Virginia University, Morgantown, W. Va.; Dr. J. N. Rose, U. S. National Museum, Washington, D. C.; and Mr. H. H. York, University of Texas, Austin, Texas.

OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 33, published in 1906, contained 635 pages of text and 26 full-page plates. Price $3.00 per annum. For Europe, 14 shillings. Dulau & Co., 37 Soho Square, London, are agents for England.

Of former volumes, only 24–33 can be supplied entire; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Vols. 24–27 are furnished at the published price of two dollars each; Vols. 28–33, three dollars each.

Single copies (30 cts.) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–11 and 13 are now completed and Nos. 1 and 2 of Vol. 12 have been issued. The subscription price is fixed at $3.00 per volume in advance. The numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **The Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

THE TORREY BOTANICAL CLUB
Columbia University
NEW YORK CITY

Vol. 7 October, 1907 No. 10

TORREYA

A MONTHLY JOURNAL OF BOTANICAL NOTES AND NEWS

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE AND PHILIP DOWELL

JOHN TORREY, 1796–1873

CONTENTS

PUBLISHED FOR THE CLUB
AT 41 NORTH QUEEN STREET, LANCASTER, PA.
BY THE NEW ERA PRINTING COMPANY
[Entered at the Post Office at Lancaster, Pa., as second-class matter]

THE TORREY BOTANICAL CLUB

TORREYA is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, fifteen cents. To subscribers elsewhere, five shillings, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to TREASURER, TORREY BOTANICAL CLUB, 41 North Queen St., Lancaster, Pa., or Columbia University, New York City.

Matter for publication should be addressed to

MARSHALL A. HOWE
New York Botanical Garden
Bronx Park, New York City

TORREYA

October, 1907

Vol. 7. No. 10.

THE NAMES OF SOME OF OUR NATIVE FERNS

By Lucien Marcus Underwood

The publication of a complete index of fern names* has necessarily resulted in disclosing some overlooked duplications, some of which affect the names currently used in American text-books. For a European, Mr. Christensen has given a remarkably liberal treatment, and follows not only the American system of citation, but in the main the principles adopted in America underlying the selection of names. For example, homonyms are quite uniformly rejected and treated after the American fashion.

The unanimity of practice anticipated by some of our conservative friends as one of the benefits of "an *authoritative* international Congress" has failed to materialize among the ferns at least. Some recent publications professedly or supposedly in accord with the rules of the Vienna Congress must have afforded rude shocks to those whose expectations rose high in anticipation of "an authoritative standard."

For example, while Mr. Christensen, Dr. Christ, Professor Urban and Professor Hieronymus of Berlin, and Dr. Rosenstock have all taken up *Dryopteris* in accordance with correct principles of nomenclatural priority, the New England botanists have pronounced in favor of *Aspidium*, and the English botanists have taken up *Lastrea* for the same group. Without question, should the French make an official pronouncement, they would use *Polystichum*, thus continuing their practice in more or less recent manuals and botanical garden labels.

At present the common male-fern bears five names which have been announced since the appearance of the Rules of Nomen-

*Christensen, Carl. Index Filicum. 1905–6.

[No. 9, Vol. 7, of Torreya, comprising pages 177–192 was issued September 21, 1907.]

clature of the Vienna Congress — a state of discord not entirely unexpected by those who took part in the proceedings of that body.

The current nomenclature of the male-fern is as follows:

1. Dryopteris Filix-mas.—American usage since 1893; adopted by Professors Urban and Hieronymus (Berlin); Dr. Christ (Basel); Dr. Rosenstock (Gotha); Mr. Christensen (Copenhagen).
(Dryopteris Adans., 1763.)
2. Polystichum Filix-mas. — French usage.*
(Polystichum Roth, 1799.)
3. Aspidium Filix-mas. — Cambridge (Mass.) usage.†
(Aspidium Swartz, 1801.)
4. Nephrodium Filix-mas. — Fern Bulletin; Kew (ancient practice).‡
(Nephrodium Rich., 1803. §)
5. Lastrea Filix-mas. — British Museum. ||
(Lastrea Bory, 1826.)

Following Diels (Die nat. Pflanzenf.) and Urban (Symb. Antill.), Christensen combines all the reniform-indusiate, non-indusiate, free-veined and connate-veined members of the tribe Dryopterideae in a single genus, *Dryopteris*. This would unite (in our flora) the genera *Phegopteris*, *Goniopteris*, and *Meniscium* with the wood-ferns of the genus *Dryopteris*. Pending further study

* As commonly seen in labels in botanical gardens; also in recently published works as: **Coste.** Flore descriptive et illustrée de la France 3: 686–688. 1906. In this work *Polystichum* and *Aspidium* are used for groups diametrically opposite to New England usage.

† *Cf.* Rhodora **9**: 81–86. 1907, where the allies of this species in the flora of "the Boston District" are placed under *Aspidium*, and the Christmas-fern is retained in *Polystichum*.

‡ No recent official pronouncement of the Kew position on this genus has been received; we await with interest to see if there will be a change and if so whether it will be aspidioid.

§ The earlier and doubtful publication by Richard (?) in Marthe's Cat. pl. Jard. med. Paris, 1801, in accord with strict rules will have to be set aside as a hyponym.

|| As expressed in the new Catalogue of British Plants (1907), "revised in accordance with the International Rules of Botanical Nomenclature adopted by the Botanical Congress at Vienna, 1905."

of this complicated generic tangle of affinities, we are unable to follow the Continental botanists in this matter. Absolute consistency is not to be looked for in generic separation, but when *Diplazium* and *Athyrium* are kept distinct from *Asplenium* by such meager and graduated characters, *Elaphoglossum* from *Acrostichum*, and *Polystichum* from *Dryopteris*, we see no consistency in uniting *Meniscium* with *Dryopteris*, or *Campyloneurum* with *Polypodium*. There is perhaps more reason for the union of *Phegopteris* * and *Dryopteris*, since the difference is one which concerns mainly indusial characters. In any case, a knowledge of the European and United States species merely is insufficient to form a reasonable basis for a proper settlement of the question, and words based on such a knowledge are mere waste of breath.

Among the necessary changes we note the following:

Ceratopteris pteridoides (Hook.)

Parkeria pteridoides Hook. Exot. Fl. **2**: *pl. 147*. 1825.

After much study of living and herbarium material we are convinced that the determinable American material we have seen extending in range from Guiana, the type locality of Hooker's species, to Florida represents a plant entirely distinct from the species of the Old World which was included by Linnaeus under his two species, *Acrostichum siliquosum* and *Acrostichum thalictroides*, and commonly known under the name *Ceratopteris thalictroides* since Brongniart established that genus. Hooker's type and excellent figures well represent the plant occasional in our American tropics and often seen in cultivation.

The American plant has leaves much less divided than its Old World congener and is everywhere excessively proliferous, growing young plantlets over its surface at the sinuses of the leaves, and even in the axils of the sporophyls. Christensen follows the customary reference of the American plant to *Ceratopteris thalictroides* (L.) Brongn., but if, as appears, there is only a single species in the Old World, that name is not a valid one. There is a slight suspicion that the Old World species may also appear in

* In the new catalogue of British plants (1907) the species of *Phegopteris* are still retained in the genus *Polypodium* in accordance with the ancient Linnaean conception of that genus.

America as an introduced plant. Curtiss' collections in Florida (Nos. 3690 and 5973) well represent the American plant, as do the similar ones of Jenman from Guiana. *Parkeria* is one of five generic names which have been independently proposed for this group of plants and was based on Parker's original collection in Guiana, a duplicate sheet of which appears in the herbarium of Columbia University.

POLYPODIUM GLYCYRRHIZA D. C. Eaton. Am. Jour. Sci. II. 22: 138. 1856

This properly takes the place of *P. falcatum* Kellogg, 1854, (not *P. falcatum* Linn. f. 1781) and of *P. occidentale* Maxon, 1904, the latter taken up from a still earlier varietal name of Hooker.

The abandonment of the validity of varietal names * was the principal compromise on the part of the adherents of the American code at the Vienna Congress. The above nomenclature is therefore in accord with both the Vienna and the American codes, and is based on the correct principle that *species* are the units of classification.

PALTONIUM LANCEOLATUM (L.) Presl, Epim. Bot. 156. 1851, appears to be the proper name for *Pteris lanceolata* L. (*Taenitis lanceolata* Kaulf.), for which we proposed Blume's subgeneric name *Cheilogramme* in 1900.

PTERIS MULTIFIDA Poir. Encyc. Bot. 5: 714. 1804

The above name should be used for the plant commonly called *Pteris serrulata* Linn. f. (1781). The earlier *Pteris serrulata* Forsk. (1775) renders Linnaeus' name untenable. In this case there is an even stronger reason: in reducing *P. serrulata* Linn. f. to synonymy under *P. multifida*, Mr. Christensen continues an error most of us have followed without actually looking up the type locality of Linnaeus' plant. As a matter of fact *Pteris serrulata* is not only not a synonym of *Pteris multifida* at all; it

* This principle was adopted in America by a small majority in 1893-4 and in practice has worked havoc with many otherwise valid specific names. Probably two thirds of the opposition to the Madison modification of the Rochester rules arose from the adoption of this one principle.

is not even a *Pteris*, but a straight synonym of *Trismeria trifoliata* of the American tropics. Linnaeus' son described *Pteris serrulata* as from Jamaica and cites Sloane *pl. 45. f. 2* and Plumier *pl. 144*, the identical illustrations cited by his father in describing *Acrostichum trifoliatum* (*Gymnogramme trifoliata* Desv., *Trismeria trifoliata* Diels) twenty-eight years earlier.

Pteris multifida was published with a short Latin diagnosis followed by an ample comparative description in French, which ends with the following statement: "Cette plante est cultivée au Jardin du Muséum d'histoire naturelle de Paris. Son lieu natal ne m'est pas connu." The type locality of this species, therefore, remains unknown, and its long period of existence in cultivation, coupled with its ready propagation by spores, renders its original habitat somewhat difficult to prove. Its native country is usually supposed to be China and Japan. It is an escape from cultivation in several of our southern States, in Jamaica and Guadeloupe, and is likely to be found in any of the warm-temperate or tropical countries, where it is frequently cultivated.

PELLAEA MUCRONATA D. C. Eaton

This name must replace *Pellaea Wrightiana* Hook. The continued use of the latter name is due to a curious oversight of the application of the so-called "Kew rule." The plant was originally described as *Allosorus mucronatus* D. C. Eaton (1856). When Hooker took up Link's genus *Pellaea* in Species Filicum (1858) he followed a common practice of his day and renamed the species *Pellaea Wrightiana*, thus making his own name the "first name under the genus." Eaton did not transfer his own name *mucronata* until a year later (1859) and his earlier publication was not unnaturally overlooked. The abolition of the Kew Rule by the Vienna Congress will render this change equally binding on those who recognize its authority. Under the American code it is a simple matter of justice and it becomes a pleasure to restore one of Professor Eaton's names.

PELLAEA SCABRA C. Chr. Ind. Fil. 483. 1906

Cheilanthus aspera Hook. 1858 (not *C. aspera* Kaulf. 1831).
Pellaea aspera Baker, Syn. Fil. 148. 1867.

The change appears to be warranted.

Asplenium abscissum Willd. Sp. Pl. **5**: 321. 1810

Asplenium firmum Kunze (1845) appears to be identical with this widely distributed tropical species and hence falls under it in synonymy.

Asplenium cristatum Lam. Encyc. Bot. **2**: 310. 1786

Asplenium cicutarium Sw. (1788), proving an exact synonym, must yield to the earlier name. The occurrence of this common tropical American fern in Florida rests on a single meager collection. Further information of its occurrence within the limits of the United States is greatly to be desired.

Mr. Christensen has made a few other changes, particularly in *Notholaena* and *Pellaea*, which we are not prepared to adopt, pending a revision of the species of these groups. Among these is the transfer of *Notholaena dealbata* and *N. tenera* to *Pellaea*. *Pellaea densa*, which Diels transferred to *Cryptogramma* in 1899, Christensen restores to *Pellaea*.

Columbia University,
September 30, 1907.

A LONG ISLAND CEDAR-SWAMP

By Roland M. Harper

No cedar swamp on Long Island (or any other island, for that matter) seems to have ever been described in botanical literature, though evidences of the occurrence of such places on the island are not wanting. Such swamps, at least in the coastal plain and southeastern part of the glaciated region of North America, are characterized by the white cedar, or "juniper," *Chamaecyparis* (formerly *Cupressus*) *thyoides*; and Dr. Torrey says of this species in his Flora of New York, published in 1843: "Long Island, where, in several places (as near Rockaway, Hempstead, Babylon and Islip) it occurs in considerable quantities." The localities mentioned are all in the coastal plain,* but I do not know that any of them have been verified in late years.

* Some maps of Long Island (such as can be seen in almost any railroad station on the island) show a settlement named "Cedar Swamp" about three and one half

In TORREYA for June, 1906, it stated that on May 30 the Torrey Club visited "a white cedar swamp near Merrick" (near the south shore of the island), and found there among other things *Dryopteris simulata*, *Woodwardia areolata* and *W. Virginica*. In *Rhodora* for April, 1907, Mr. J. T. Nichols reported "a good colony of the tree growing . . . between the stations of Merrick and Bellmore, Nassau Co." (doubtless the place visited by the Torrey Club), and regarded this as the westernmost known station for it on the island, which it probably is, unless Torrey's Rockaway station still exists.

Following the clue given by Mr. Nichols, I went on July 3d, last, to the place indicated, which is just 25 miles from Long Island City by rail. The *Chamaecyparis* occurs for some distance (several hundred yards at least) north and south of the railroad, along Baldwin Creek, a small stream two or three miles in length. It is most abundant below the railroad, and almost within a stone's throw of the salt marsh into which the creek flows. Here there are some thousands of the trees in question, ranging from about 3 to 10 inches in diameter and 30 to 40 feet in height, growing in the driest situation in which I ever found this species, a condition which, however, is probably not natural. For just above the railroad the creek is dammed up to make one of the reservoirs of the Brooklyn water system, and as shown by Veatch,* whenever a stream in the sandy coastal plain of Long Island is thus obstructed a large amount of water escapes through the porous sides of the pond. The fact that no trees less than three inches in diameter were seen would seem to indicate that no young ones have come up for several years, perhaps ever since the reservoir was made.

The only other trees noticed in this swamp were a few specimens of *Sassafras*, one at least a foot in diameter and as tall as

miles northeast of Roslyn, in the glaciated region; but on a recent visit to the spot indicated I could find no perceptible aggregation of houses, no *Chamaecyparis*, nor even any swamp. Inquiry at a house near by elicited the information that the road I was on was called the Cedar Swamp Road, but my informants did not know why, and after walking along it for several miles I knew no more about it than before.

* Professional Paper U. S. Geol. Surv. 44: 62. 1906. "The effect of dams in the brooks of Long Island is . . . to very materially decrease the stream flow at the points where dams are erected."

the cedars, and several of *Acer rubrum*. The shrubby and herbaceous vegetation consisted chiefly of the following species :

Viburnum dentatum
Kalmia latifolia
Clethra alnifolia
Aralia nudicaulis
Parthenocissus quinquefolia
Ilicioides mucronata
Ilex verticillata (?)
Benzoin aestivale
Rhus Vernix
Rhus radicans
Rubus hispidus
Unifolium canadense
Arisaema triphyllum
Spathyema foetida
Carex folliculata
Lycopodium lucidulum
Woodwardia (*Lorinseria*) *areolata*
Dryopteris simulata (?)
Osmunda spectabilis (*regalis*)
Osmunda cinnamomea
Sphagnum sp.

A little farther up the creek, near the railroad, were noticed most of the same species, and in addition *Trientalis americana*, *Gaylussacia frondosa*, and *Azalea viscosa glauca*.

The *Aralia* seemed to be the most abundant dicotyledon in the swamp. *Lycopodium lucidulum* does not seem to have been previously reported from Long Island, though Dr. G. H. Shull tells me that it is not uncommon in the vicinity of Cold Spring Harbor, on the north shore. I was greatly surprised to find it in the coastal plain (doubtless a new region for it), and so close to a salt marsh.

Chamaecyparis thyoides is one of the very few conifers (and the only water-loving one) indigenous to both the glaciated region and coastal plain, and the only one now confined to these two regions.* (Not much is known of its prehistoric distribution, for in the fossil state it is reported only from the Pleistocene of New Jersey, and the buried trunks found in the coastal plain farther south are mostly in places where it still grows.) Its relations to the topography in the two different regions are rather interesting. In the glaciated region I have seen it only in "kettle-holes," or "undrained swamps," while in the coastal plain it seems to be confined to "drained" but non-alluvial swamps. Its very irregular distribution in the coastal plain has been recently commented upon.†

College Point, L. I.

* See Rhodora 7 : 71. 1905.
† Bull. Torrey Club 34 : 377. 1907.

DETERMINATIONS OF CUBAN PIPERACEAE

By C. F. Baker

During the past two years a large number of specimens of Piperaceae have been distributed from the herbarium of the Estación Central Agronómica de Cuba. These were collected in the Provinces of Habana and Pinar del Rio by employees of the Station and by Mr. H. A. Van Hermann. In some instances the names originally placed on the specimens were incorrect, and in many cases no specific name was given. Determinations of these specimens have largely been furnished by Dr. I. Urban and by Prof. C. de Candolle, and to these gentlemen acknowledgments are due. I have also compared all of them with material in the Sauvalle-Wright collection and with some material received in exchange. It will be of interest and importance to all who have received the specimens to have access also to these combined notes.

Peperomia rotundifolia Kth.

Rangel, Prov. Pinar del Rio (*4215*). This is exactly equivalent to Wright's *no. 521*, labelled *nummularifolia* by him, but in Symbol. Antill. **3**: 228, called *rotundifolia* Kth.

Peperomia sp. nov.

Mountains above Taco-Taco (*3833*).

Peperomia alata R. & P.

Santa Barbara, near Bejucal (*3382*). Dr. Urban has referred this to *P. glabella* A. Dietr. These specimens are, however, equivalent to our specimens of Wright's *no. 503*, which was questionably labelled *P. pterocaulis* Miq. by Wright, and in the Symbol. Antill. **3**: 241, referred to *P. alata* R. & P.

Piper aduncum L.

As determined by de Candolle, it appears that none of the many western Cuba specimens sent out under this name by us and by others belong here. We have specimens of true *aduncum* only from eastern Cuba (Eggers *no. 4654*). All of our Western Cuba specimens issued as this belong to *P. elongatum* var. *Ossanum*.

Piper articulatum A. Rich.

Vento (*1322*).

Piper elongatum Vahl

In a recent letter de Candolle says "With regard to *Piper elongatum* Vahl, I must tell you that I have quite recently come to the conclusion that this name is to be substituted to that of *Piper angustifolium* R. & P."

Piper elongatum Vahl, var. Ossanum C. DC.

Near Artemisa (*1750*); mountains near Taco-Taco (*3788*); Managua (*4570*); Rincón (*1016*); Vento (*585*); Santiago de las Vegas (*3657, 2208, 447*). All were issued as *aduncum*.

Shafer's *no. 459* from Madruga, and his specimen without number from Havana, as well as Curtiss' *no. 443* from Isle of Pines, all belong here.

All of Sauvalle's *no. 2241*, represented by five sheets and labelled *Artanthe adunca*, are this, as well as Wright's "El Retiro, Apr. 4" specimen (Sauvalle *no. 2243*), labelled *elongata*.

In Symbol. Antill. **3**: 186, de Candolle refers to Sauvalle's *no. 2241* under *confusum*. Sauvalle had placed Wright's *no. 773* with his *no. 2241*, though Wright's label bears also the name *Piper confusum* C. DC. Wright's field notes for *confusum*, which I have not seen quoted, read "*Artanthe adunca* Miq.? Principal veins 3–4 pairs and smaller. Along rivulets in woods. Monte Verde. May." This would indicate a habitat distinct from that of *aduncum*, or of *elongatum* var. *Ossanum*.

Piper hispidum Sw.

San Antonio de los Baños (*4773*); Vento (*572*). The latter was labelled *hirsutum*.

Piper hispidum C. DC. var. magnifolium C. DC.

San Antonio de los Baños (*4117, 4578*) were issued simply as *hispidum*. Santiago de las Vegas (*3647, 5055*).

Two N. Y. Botanical Garden specimens from Matanzas (*229, 420*) also belong here.

Piper medium Jacq.

San Antonio de los Baños (*4122, 4789*). This forms dense thickets along the wooded river banks above the town.

Piper rigidum C. DC.

Santa Catalina (*3262*). One of many fine things brought from this interesting locality in the western Sierra, by VanHermann.

Wright's *no. 1418*, *rigidum* var. *verdeanum*, is Sauvalle's *no. 2247*. Wright's *2269* and *2270* are Sauvalle's *no. 2238*. But on two other specimens of his own, doubtless of the collecting of Blain in western Cuba, Sauvalle has also placed the number *2238*, though these specimens are much more like Wright *1418* — Sauvalle *2247*. But neither of these two specimens are at all like our *no. 3262*.

HECKERIA UMBELLATA (L.) Kth.

Abundant along fence rows, borders of thickets, and outcropping ledges, all through western Cuba. Specimens issued are from Managua (*1562*); hills near Candelaria (*1614*, *1615*); near Artemisa (*1751*); Guanajay Mountain (*2187*); Rangel (*3833*); Vento (*582*); near Calabazar (*4905*); Santiago de las Vegas (*1089*, *3523*). I have not yet seen *peltata* growing in western Cuba. Dr. Maza has in the Jardin Botanico de la Universidad de Habana, a foreign *Heckeria* which, however, is not *peltata*.

SANTIAGO DE LAS VEGAS, CUBA.

SHORTER NOTES

A REDWOOD DESCRIBED AS A MOSS. — In the account of the fossil mosses of Florissant, published by Mrs. Britton and Dr. Hollick in the *Bulletin of the Torrey Botanical Club* for March, is a new figure of *Hypnum Haydenii* Lesq., accompanied by the remark that it appears to be a conifer. From a study of a large amount of material from Florissant, I had already concluded that the conifers found there belonged to four species,* namely *Sequoia affinis* Lesq., a *Sabina*, and two species of *Pinus*. The alleged moss has no particular resemblance to the *Sabina* or *Pinus*, but it *exactly agrees with the growing tips of the Sequoia*. I have before me a branch, with ordinary leaves, of *Sequoia affinis*, and on the same piece excellent "*Hypnum Haydenii*." There appears to be no doubt whatever about the identity of the two, and the moss name has priority of place. Hence the Florissant redwood

* The particulars will be published in Bull. Amer. Mus. Nat. Hist.

appears to be entitled to the name **Sequoia Haydenii** (*Hypnum Haydenii* Lesq. Ann. Rept. U. S. Geol. and Geog. Surv. Terr. 1874: 309. 1876; *Sequoia affinis* Lesq. *l. c.* 310).

T. D. A. Cockerell.

University of Colorado,
Boulder, Colorado.

REVIEWS

Two recent Papers by O. F. Cook

"*Origin and Evolution of Angiosperms through Apospory.*"* It is suggested in this paper that the phylogeny of the angiosperms is not to be sought from the bryophytes, up through the cycadofilices, but "more directly in some such primitive condition as the thallose liverworts." The female reproductive apparatus of the angiosperms would thus be considered analogous (homologous?) to the fern prothallia that are borne directly upon the sporophyte without the intervention of spores.

Anthoceros is named as the most probable hepatic ancestor of the angiosperms, since it is held to be, in point of structure, "farther advanced than the ferns in the direction of the angiosperms. . . . The independent existence of the vegetative *Anthoceros* capsule would afford a plant like a seedling angiosperm with its two cotyledons, but bearing spores on the inner surfaces of the cotyledons. No steps are required which have not been closely paralleled in the evolution of one or another of the archegoniate plants. . . . The part of the angiosperm which, in the present view, might correspond to the prothallus itself, is the nucellus."

"The fern and the flowering plant are alike in that their ancestors can be traced back to the capsules of simple thallose plants like *Anthoceros*, but there appears to have been at some very remote point a divergence of procedure, the group which gave rise to the ferns and gymnosperms retaining for a much longer period a functional prothallus which the adoption of apospory enabled the ancestors of the angiosperms to completely eliminate."

* Cook, O. F. Proc. Wash. Acad. Sci. 9: 159. 1907.

In this connection it will be recalled that in 1891 Atkinson suggested that the embryo-sac is to be interpreted as a female prothallus, originating from the nucellus by apospory, but that there is not, therefore, to be inferred any phylogenetic connection with earlier forms, nor that the process of aposporous origin of the gametophyte is continuous through the groups of plants.

"*Mendelism and Other Methods of Descent.*"* This paper is an elaboration of a discussion of Davenport's lecture on "Heredity and Mendel's Law," delivered before the Washington Academy of Sciences, on February 26, 1907. It is contended that, "the definite mathematical relations which appear in a Mendelian experiment arise from the methods of reproduction rather than from the methods of inheritance," and that the inferences as to the existence of character-unit-particles and the purity of germ cells are rendered entirely unnecessary by the interpretations which the author gives to the experimental results of others.

Descent and heredity are by no means synonymous. There are outlined twenty-two different methods of descent, of which heredity is one, mutation another, and Mendelism another. "Heredity, in the more definite sense, is a fact, but only under conditions of restricted descent." Mendelism is not a form of heredity, but "constitutes a rather wide departure from the primary concept of heredity." It is "one of the methods of descent in which unlike produce unlike." According to Cook, there has been a complete failure, thus far, to demonstrate the Mendelian principles. The terms hybrid and cross seem (p. 223) to be considered as synonyms.

Although artificial selection has been satisfactorily practiced in horticulture for decades, the author declares that, "generally speaking, the cells which compose the bodies of the higher organisms do not leave any descendants to perpetuate their characters." Mutation and Mendelism "are not phenomena of evolution, but of degeneration," and, "when the distinction between discontinuous variation and discontinuous evolution is once appreciated, it will become apparent that the mutation theory

* Cook, O. F. Proc. Wash. Acad. Sci. 9 : 189. 1907.

and the Mendelian 'laws' which have been enlisted in its support are assumptions which the facts do not warrant."

Here certainly is a challenge that, to say the least, cannot be considered wavering or indirect. Without discussing these iconoclastic ideas, it may be remarked that the author's conclusions are diametrically opposed to the inferences of practically every investigator who has derived his knowledge of the facts at first hand.

C. Stuart Gager.

FIELD MEETINGS OF THE TORREY BOTANICAL CLUB, SEASON OF 1907

Below is a list of the field meetings of the Club during the present season, as announced by the field committee. In a few cases, the program was not carried out on account of unfavorable weather.

May 4. West Orange, N. J. Guide, Mr. P. Wilson.

May 11. Great Notch, N. J. Guide, Mr. Frederick K. Vreeland.

May 18. Hempstead, Long Island. Special excursion for violets. Guide, Miss Fanny A. Mulford.

May 25. Mount Kisco, N. Y. Guide, Dr. P. A. Rydberg.

May 30. Avon, N. J. Guide, Mr. P. Wilson.

June 1. Long Beach, Long Island. Guide, Dr. R. M. Harper.

June 8. Mountain Station, N. J. Guide, Mr. William H. Smith.

June 15. Scarsdale, N. Y. Special excursion for fungi. Guide, Dr. W. A. Murrill.

June 22. West Orange, N. J. Guide, Mr. R. C. Benedict.

June 29. New York Botanical Garden and vicinity. Special subject: "The Care and Protection of Trees." Guide, Dr. C. Stuart Gager.

July 1–7. Fourth Botanical Symposium. Joint meeting of the Torrey, the Philadelphia, and the Washington Botanical Clubs. Newton, Sussex County, N. J. Reported in Torreya for August by Dr. Philip Dowell.

July 13. Central Park, New York City. Guide, Dr. E. B. Southwick.

July 20. Moonachie, N. J. Guide, Mr. George V. Nash.
July 27. Little Falls, N. J. Guide, Dr. H. H. Rusby.
August 3. Summit, N. J. Guide, Dr. P. A. Rydberg.
August 10. Great Island, N. J. Guide, Dr. H. H. Rusby.
August 17. Saw Mill Valley, Borough of the Bronx, New York City. Special excursion for mosses. Guides, Mrs. N. L. Britton and Mr. R. S. Williams.
August 24. Sneeden's Landing, N. Y. Guide, Mr. Norman Taylor.
August 31. Richmond, Staten Island. Guide, Dr. Philip Dowell.
September 7. Prince's Bay, Staten Island. Guide, Dr. Arthur Hollick.
September 14. New Rochelle, N. Y. Guide, Miss Daisy Levy.
September 21. Arlington, Staten Island. Guide, Professor L. M. Underwood.
September 28. Mosholu, N. Y. Special excursion for asters. Guide, Professor E. S. Burgess.
October 5. Hunter's Island, New York City. Special excursion for marine algae. Guide, Dr. Marshall A. Howe.
October 12. New York Botanical Garden. Special subject: "Variations in Plant Organs; a Study in Morphology." Instructor and guide, Dr. C. Stuart Gager.

NEWS ITEMS

John H. Schaffner, associate professor of botany in the Ohio State University, will spend the present scholastic year in Germany and Dr. A. Dachnowski will act as substitute for him during his absence.

Dr. C. B. Robinson, assistant curator of the New York Botanical Garden since July 1, 1906, has been appointed economic botanist of the Bureau of Science of the Government of the Philippine Islands, and is planning to sail for Manila early in the coming year.

Dr. Harold L. Lyon has resigned the assistant professorship of botany in the University of Minnesota in order to accept a

position as assistant director of the pathological laboratory of the experiment station maintained by the Hawaiian Sugar Planters' Association at Honolulu.

Mr. Oakes Ames, founder of the Ames Botanical Laboratory at North Easton, Massachusetts, has presented his valuable collection of living orchids to the New York Botanical Garden. The collection includes plants of great rarity and will form a notable feature in the conservatories of the Garden.

Professor William Bateson, of Cambridge University, England, is announced by the Brooklyn Institute of Arts and Sciences to give three illustrated lectures entitled "Demonstrations of Mendel's Principles of Heredity," at the Art Building Hall, 174 Montague Street, on the evenings of October 3, October 31, and November 1.

Professor C. F. Baker, for three years past chief of the department of botany in the Estación Central Agronómica, at Santiago de las Vegas, Cuba, has been appointed curator of the herbarium and botanic garden at the Museu Goeldi, Para, Brazil. All letters and packages should be addressed to him at that point after November 1, 1907. His especial work there will be the further development of the herbarium and garden at Para, and the botanical exploration of some of the most interesting parts of the Amazon valley.

The New York Botanical Garden announces for the autumn of 1907 the following program of Saturday afternoon lectures:

Oct. 5. "The Salton Sea and its Effect on Vegetation," by Dr. D. T. MacDougal.

Oct. 12. "Collecting Fungi in the Wilds of Maine," by Dr. W. A. Murrill.

Oct. 19. "The Forms and Functions of Leaves," by Dr. C. Stuart Gager.

Oct. 26. "The True Grasses and their Uses," by Mr. George V. Nash.

Nov. 2. "The Giant Trees of California: their Past History and Present Condition," by Dr. Arthur Hollick.

Nov. 9. "The Progress of the Development of the New York Botanical Garden," by Dr. N. L. Britton.

Nov. 16. "Edible Roots of the United States," by Dr. H. H. Rusby.

The lectures will be delivered in the museum building at 4 o'clock and will be illustrated by lantern slides and otherwise.

OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 33, published in 1906, contained 635 pages of text and 26 full-page plates. Price $3.00 per annum. For Europe, 14 shillings. Dulau & Co., 37 Soho Square, London, are agents for England.

Of former volumes, only 24–33 can be supplied entire; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Vols. 24–27 are furnished at the published price of two dollars each; Vols. 28–33, three dollars each.

Single copies (30 cts.) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The MEMOIRS, established 1889, are published at irregular intervals. Volumes 1–11 and 13 are now completed and Nos. 1 and 2 of Vol. 12 have been issued. The subscription price is fixed at $3.00 per volume in advance. The numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **The Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

THE TORREY BOTANICAL CLUB
Columbia University
NEW YORK CITY

Vol. 7 November, 1907 No. 11

TORREYA

A Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE AND PHILIP DOWELL

JOHN TORREY, 1796–1873

CONTENTS

Published for the Club
At 41 North Queen Street, Lancaster, Pa.
by The New Era Printing Company

[Entered at the Post Office at Lancaster, Pa., as second-class matter]

THE TORREY BOTANICAL CLUB

TORREYA is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, fifteen cents. To subscribers elsewhere, five shillings, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to TREASURER, TORREY BOTANICAL CLUB, 41 North Queen St., Lancaster, Pa., or Columbia University, New York City.

Matter for publication should be addressed to

MARSHALL A. HOWE
New York Botanical Garden
Bronx Park, New York City

TORREYA

November, 1907

Vol. 7. No. 11.

A VISIT TO LETCHWORTH PARK

By George V. Nash

Lying in the western part of New York state, in the counties of Wyoming and Livingston, is a wild and picturesque country, through which the Genesee River wends its way. Here, in a strife which was begun in ages past and which is still continued between the waters and the land, this river has cut for itself, in a portion of its course, a deep gorge between two and three miles long. In this distance the river has a fall of about three hundred feet, the greater part of this being concentrated in three falls, known as the upper, middle, and lower falls. Crossing this gorge, immediately above the upper fall, is a bridge, from which one can look down on the swirling waters of the river 232 feet below, just above where they take their plunge of about ninety feet over the upper fall, which stretches itself diagonally across the river in a somewhat curved line, its lower edge resting on the westerly bank. About 2,200 feet below the upper fall is the middle fall, which is said to plunge 110 feet to the waters below. This is by far the largest of the three falls and the most impressive. It has worn itself a deep pit, in which the maddened waters eddy and swirl, finally emerging, humbled and subdued, as a narrow stream, which flows quietly for about a mile and a third, when it again becomes troubled, and makes its final plunge over the lower fall, which has a height of about sixty feet. Here we find Table Rock, a plateau some 800 feet long and about 150 feet wide, almost truncate at its lower end, over which, in times gone by, the river leaped to the waters sixty or seventy feet below. To the right of this Table Rock, as you look down stream, the Genesee rushes madly through a narrow and deep channel it has cut for itself in comparatively recent times. The southerly side of

[No. 10, Vol. 7, of Torreya, comprising pages 193–208, was issued October 18, 1907.]

this rocky plateau, at one time the bed of the river, must have been of material much softer in nature than the remainder of the rock, else the river would not have made its present channel there. Standing on the edge of this channel and looking into the churning waters below, one cannot help but realize what his fate would be were he to make a misstep and fall. At the western end and in the rear of Table Rock, across an intervening chasm, is the lower fall, resembling more the upper fall in the diagonal line of its brink which has its upper end resting on the north shore. The fall has worn for itself an ample basin, bounded by Table Rock and its own brink, the shape of which, the oldest inhabitants declare, has changed considerably in the past fifty years. Below Table Rock the waters wend their monotonous way, quite changed in character from their aggressiveness of the upper stretches.

It is between the lower and middle falls that the gorge of the Genesee is best developed. Here we find sheer perpendicular precipices rising 300 to 500 feet above the surface of the river, which, viewed from above, looks like a tiny silver thread.

As I have said, it is the middle fall which is the most impressive. And here, within hearing of the constant roar of this falling mass of waters, the spray from which is often carried by the wind onto the house itself, the Honorable James Pryor Letchworth has made his home for over fifty years. It is to the generosity of this gentleman, whose horizon is not bounded by the narrow confines of commercialism, that the public is indebted for this beautiful tract, now accepted by the state as a gift from Mr. Letchworth, and bearing the name of Letchworth Park, a fitting honor commemorating a noble deed. The tract was acquired gradually by Mr. Letchworth by the expenditure of a considerable sum. By the deed of gift he is to enjoy the use of the property as long as he lives, it then passing to the state, under the guardianship of The American Scenic and Historic Preservation Society, of which Mr. J. Pierpont Morgan is honorary president and Mr. Geo. F. Kunz president.

The tract embraces over 1,000 acres, and includes both sides of the river for a distance of nearly three miles, comprising in this extent all three of the falls, thus, it is to be hoped, protecting them from the devastating hand of those who see nothing in the

imposing works of nature but dollars and cents and to whom her beauties and the rights of others make no appeal.

Mr. Letchworth lives in a home-like roomy house situated only about 250 feet from the edge of the precipice which makes a sheer descent into the deep pool in front of the fall. Here on bright sunny days rainbows play in the mists constantly arising from the tumbling waters, distant but about 350 feet from the house, and from this Mr. Letchworth has named his home Glen Iris.

The object of my visit to this park was to name and have properly labeled the trees in the vicinity of the roads and paths, which Mr. Letchworth has constructed and is constructing through this tract, that the public may have easy access to all of its beauties. One is at once struck here by the purity of the vegetation. By this I mean the almost entire absence of plants not native to the tract. Even in the immediate neighborhood of the house, where the open lawns would permit of such treatment, but few extraneous species are to be found. Such plants are, however, represented by the horse-chestnut (*Aesculus Hippocastanum*), of Greece, the sweet or yellow buckeye (*Aesculus octandra*), of the southeastern United States, and the fetid or Ohio buckeye (*Aesculus glabra*), of the central United States. Others of this nature are the sweet gum (*Liquidambar Styraciflua*), the Norway maple (*Acer platanoides*), of Europe, the maiden-hair tree (*Ginkgo biloba*), of China, the purple form of the European beech (*Fagus sylvatica purpurea*), the Norway spruce (*Picea excelsa*), of Europe, in some noble specimens, and the Colorado spruce (*Picea Parryana*). It is plain on all sides that every attempt has been made to keep things as nature made them. The arboreal vegetation is well represented, and in one region down near the lower fall, inaccessible to the lumberman on account of the precipitous bluff on one side and the raging waters of the river on the other, are some large trees, perhaps representing the original growth. I had a most enjoyable time for two days going over this tract. Of course in that limited period it was not possible to make an exhaustive study of the trees, my operations being confined to the vicinity of the paths, but here a large proportion of the species must be represented.

Among the conifers the most common tree is the white pine (*Pinus Strobus*). This grows in great quantities, springing up

readily on all unoccupied lands. Occasionally, where the destroying ax of the lumberman did not do its deadly work before Mr. Letchworth acquired possession of the land, large specimens of this tree are to be found. The next conifer in point of frequency is also a pine (*Pinus resinosa*), the Canadian, Norway, or red pine. This also has attained a great size in places, especially along the path which skirts the north shore of the river on the way to the lower fall. The red cedar (*Juniperus virginiana*) occurs sparingly. The hemlock (*Tsuga canadensis*) is also quite common, vying in frequency with the Canadian pine. The tulip-tree (*Liriodendron Tulipifera*) is quite conspicuous in places with its shaft-like columnar trunks, and the American beech (*Fagus grandifolia*) added a touch of gray to the forest. The American elm (*Ulmus americana*), the chestnut (*Castanea dentata*), and the American linden or basswood (*Tilia americana*), are of frequent occurrence. The dreaded chestnut disease, which is causing such havoc to these trees in the vicinity of New York City, does not appear as yet to have reached this neighborhood. A single tree of the white basswood (*Tilia heterophylla*) was observed on the brink of the precipice, not far from the house. The paper or canoe birch (*Betula papyrifera*) and the yellow birch (*Betula lutea*) are occasionally met with. The American hornbeam (*Carpinus caroliniana*) is not as common as the hop-hornbeam (*Ostrya virginiana*). The common wild black cherry (*Padus serotina*), with its rough checkered bark, is not uncommon. Among the hickories the small-fruited hickory (*Hicoria microcarpa*) is much more frequent than the shag-bark (*Hicoria ovata*). The ashes yield but one species, so far as observed, that was common, and this was the white ash (*Fraxinus americana*). A second species with a tall straight trunk was observed, but the foliage was borne so high in the air that it was not possible to make a satisfactory determination of it. From leaflets picked up on the ground I am strongly inclined to think it is the green ash (*Fraxinus lanceolata*). Its bark was very coarse and deeply furrowed. The maples yielded the sugar maple (*Acer Saccharum*) in abundance, and the red maple (*Acer rubrum*) more sparingly. Of the black sugar maple (*Acer nigrum*) only a few specimens

were seen. The oaks are perhaps the most numerous as to species, of which five were noted. These are: the white oak (*Quercus alba*), the most abundant; the red oak (*Quercus rubra*), perhaps next in frequency; the black oak (*Quercus velutina*); the chestnut or yellow oak (*Quercus acuminata*); and the gray oak (*Quercus borealis*). Other trees seen in the tract are the walnut (*Juglans nigra*), rare; the butternut (*Juglans cinerea*), common; the buttonwood or sycamore (*Platanus occidentalis*), rare; the large-toothed aspen (*Populus grandidentata*), the cottonwood (*Populus deltoides*), and the balm of Gilead (*Populus candicans*); the cucumber-tree (*Magnolia acuminata*) was quite frequent, especially in the woods bordering the path on the north side of the river on the way to the lower fall; and the flowering dogwood (*Cynoxylon floridum*).

The shrubby vegetation was not particularly noted, as the time was fully occupied in inspecting the trees. One could not help but notice a number of species of the thorn (*Crategus*), some of them really small trees. The witch hazel (*Hamamelis virginiana*) was attractive in its yellow flowers, just unfolding. The spice-bush (*Benzoin Benzoin*), the speckled or hoary alder (*Alnus incana*), and the dockmackie (*Viburnum acerifolium*) were among those seen. There were many herbaceous plants, but the time at my disposal would not permit of even a cursory examination of them. It would be an interesting work to prepare a list of all the plants growing wild within the confines of this park, and such a list might perhaps have its value to the public.

Another interesting feature of Letchworth Park is what is known as the Council House grounds, a small area so named on account of the presence there of an old Indian council house, moved from its former site by Mr. Letchworth for preservation here. This house was taken down under Mr. Letchworth's directions, each part being carefully numbered, and erected again in its original form. Near by stands a modern structure containing a valuable collection of Indian relics. And not far off is the grave of Mary Jamison, a white woman who had rather a checkered career in her enforced life among the Indians.

Mr. Letchworth informed me that many people visit the

grounds, which are open every week day and during the afternoon on Sundays, the latter a recent innovation to accommodate visitors who are not able to visit the park at other times. People come from Rochester, Buffalo, and other neighboring towns, often in the form of classes or excursions of considerable size. The region is accessible from Portage, a station on the Erie Railroad, distant from New York City about 363 miles. This station is but a short distance from the bridge, referred to in the early part of this article, across which one must go to reach the system of paths installed by Mr. Letchworth. From this bridge one gets his first introduction to the gorge of the Genesee, for a magnificent view is obtained, from this high vantage point, of the falls and gorge.

The whole tract is beautiful and impressive with its rugged wild scenery, the grandeur of its water falls, and the feeling of the wild that pervades it all. The public and the state are certainly to be congratulated upon the acquisition of so beautiful a park, and it is devoutly hoped that no mercenary interests, for none others would have the inclination nor the audacity, will succeed in accomplishing anything that will mar the beauty and the grandeur of this, one of nature's finest works.

New York Botanical Garden.

SOME RARE AND INTERESTING PLANTS OF BERKS COUNTY, PENNSYLVANIA

By W. H. Leibelsperger

Notwithstanding the fact that some of the plants here listed may never have been credited to this locality, they have all been found by the writer in his many botanical and ornithological tramps. The plants listed have been found either on the Irish Mountains south of Fleetwood, on the Blue Mountains, which lie about fifteen miles north of the Irish Mountains, or in the vast stretch of hills and lowlands between these mountains.

The "Illustrated Flora" of Britton and Brown has been followed in nomenclature and arrangement.

Ophioglossum vulgatum L. Rare. Specimens of this odd little

fern were found in a sandy meadow near Moselem Springs, and in moist rich woods in the Blue Mountains, where nice specimens were found on October 13, 1907. Specimens 13 inches high were seen.

Botrychium simplex E. Hitchcock. Rare. This interesting little grape-fern was found on June 30, 1907, at the edge of moist woodland about one mile southeast of Fleetwood. Numerous specimens, ranging in height from 3 to 9 inches, were found.

Botrychium lanceolatum (S. G. Gmel.) Ångs. Rare. Specimens of this fern were found in the locality named for *B. simplex*, but later.

Botrychium dissectum Spreng. Frequent specimens were found in meadows and moist woods on the Irish Mountains, as well as on the Blue Mountains.

Camptosorus rhizophyllus (L.) Link. Frequent. The walking-fern grows in a number of places in the county, but the largest specimens, with leaves from 9 to 15 inches long, were found near Lenhartsville.

Cypripedium hirsutum Mill. Not common. Specimens of this ornamental plant were found on the Irish and the Blue Mountains. Many plants with two flowers have been seen.

Orchis spectabilis L. Infrequent. Specimens of this pretty and interesting plant were found near Pikeville and in the Blue Mountains.

Habenaria orbiculata (Pursh) Torr. Rare. Specimens were found about two miles southeast of Fleetwood.

Habenaria ciliaris (L.) R. Br. Infrequent. This, the most handsome species of the genus, grows in moist rich woods on the Irish Mountains, as well as on the Blue Mountains.

Habenaria psycodes (L.) A. Gray. Not common. Specimens were found near Pricetown.

Pogonia ophioglossoides (L.) Ker. Frequent. Found in several localities, but is not so frequently met with as *P. verticillata*.

Aplectrum spicatum (Walt.) B.S.P. Rare. This interesting plant is found in a number of places in the county, but is everywhere regarded as rare.

Hydrastis canadensis L. Rare. Golden seal was found near Evansville, the only locality known to the writer.

Coptis trifolia (L.) Salisb. This interesting little evergreen plant grows abundantly in moist rich woods southeast of Fleetwood as well as in the Blue Mountains.

Caulophyllum thalictroides (L.) Michx. Infrequent. This plant has been found in a number of places, but it grows most abundantly several miles north of Virginsville.

Crataegus moselemensis Gruber. The typical *Crataegus moselemensis* stands about one-half mile west of Moselem. This giant hawthorn is probably without an equal, being 7 m. high and having a spread of 13.7 m. It has a trunk circumference of 2 m. near ground and is about 95 years old.

Drosera rotundifolia L. This insectivorous plant was found in several bogs on the Irish Mountains.

Cubelium concolor (Forst.) Raf. Not common. Found numerous specimens, ranging in height from 0.6 m. to 1 m., near New Jerusalem, the only locality known by the writer.

Panax quinquefolium L. This plant is becoming very scarce in this locality owing to the high price realized for its root. Specimens were found near Harlem.

Oxycoccus macrocarpus (Ait.) Pers. Grows abundantly in bogs near Pricetown, the only known locality in the county.

Gentiana crinita Froel. Infrequent. Found in a meadow in "Pine Swamp," Blue Mountains.

Truly did some poet write:

> "Thou waitest late and comest alone,
> When woods are bare and birds are flown,"

for the writer has found nice specimens in blossom as late as November 15.

Obolaria virginica L. Infrequent. This ornamental little plant presents a decided exception to the other members of the family in that it makes its appearance early in the spring. Specimens have been found in different localities in the county, but the prettiest branching specimens are found in rich woods near Moselem.

Menyanthes trifoliata L. Rare. This interesting member of the gentian family grows abundantly in a bog near New Jerusalem, the only locality known to the writer. Specimens with 4-foliolate leaves have been collected.

Limnanthemum nymphaeoides (L.) Hoffm. & Link. Rare. This pretty and interesting plant grows in a small pond near Moselem. How it happened to be introduced there the writer has in vain tried to ascertain.

Castilleja coccinea (L.) Spreng. This showy parasite decorates some meadows southeast of Fleetwood.

Thalesia uniflora (L.) Britton. Frequent. Specimens of this yellowish root-parasite have been found in a number of places in the county.

Triosteum angustifolium L. Rare. This plant is much scarcer in this locality than its sister species, *T. perfoliatum*. Specimens were found near Moselem.

FUNGI

Sparassis Herbstii Peck. This handsome fungus was named by Prof. C. H. Peck after the late Dr. William Herbst, of Trexlertown, Pa. Specimens have been found in open woods near Pricetown, Pa.

Hydnum Caput-ursi Fr. The only specimen ever seen by the writer was found on an oak stump near Moselem.

Hydnum coralloides Scop. A beautiful specimen of this fungus was found at Moselem, by Mr. S. S. Gruber and presented to the writer. It grew from a dead hickory stump about four feet from the ground.

Cordyceps herculea Schw. Specimens of this interesting parasitic fungus were found in rich woods at Moselem and identified by Prof. C. H. Peck.

Polyporus frondosus Fr. A fine specimen of this fungus was found near Fleetwood. It was in the form of a spherical cluster about one foot in diameter.

FLEETWOOD, PA.

A NEW MAPLE FROM SOUTHERN CALIFORNIA

BY LE ROY ABRAMS

A few years ago Dr. E. L. Greene (Pittonia, **5**: 1–3) described four new species of *Acer* as segregates of *Acer glabrum* Torr. Three of these species we have been able to examine, and from

the specimens at hand we are convinced that the characters hold well geographically, although more complete material may prove that they intergrade. In addition to these apparently good species there is another maple of this group growing in the moun-

FIGURE 1. Photograph of a branch of *Acer bernardinum* Abrams, about three-eighths of its natural dimensions.

tains of southern California which cannot be placed with any of the described species. Specimens of this geographically isolated maple have been known to us for several years, but we have hesitated to describe the species, hoping that we might be able to study the plants in the field. The prospects, however, of a field acquaintance being still uncertain we shall describe the species from the available material, which was collected by Mr. S. B. Parish (*5128*) in Snow Cañon, 6,500 feet altitude, San Bernardino Mountains, June 20, 1901.

Acer bernardinum sp. nov.

A low bushy shrub, 15–20 dm. high; branches slender, with smooth whitish-gray bark. Leaves 15–25 mm. broad and about the same length, cordate at base, 3-lobed to near the middle; central lobe as broad as long, with 2 shallow tooth-like lobes, these with 2–3 short teeth; petioles slender, 10–12 mm. long. Fruiting pedicels 1–3, 9–12 mm. long; samaras strongly divergent.

Nearest related to *Acer Torreyi* Greene, but distinguished by its much smaller and less incised leaves, shorter petioles, and whitish-gray instead of reddish twigs.

Leland Stanford Jr. University.

SHORTER NOTES

Botrychiums in Sand. — The bay of Seven Islands is on the north coast of the Gulf of St. Lawrence, about three hundred and twenty-five miles below Quebec, or nearly half way from that city to the straits of Belle Isle. The western shore of the bay and the islands which fringe its mouth are composed of felspathic rock, but the eastern shore is a continuous stretch of sand. This sand region follows down the bay to the mouth, about four miles, and then keeping the configuration of the coast bends to the east and extends at least as far as Moisie, the next settlement, eighteen miles away. Inland, the soil, if it can be so termed, consists of sand dune after sand dune of no great height, the whole thus forming a belt of sand nearly twenty miles long and at first at least four miles wide, with no trace of rock in the parts about to be discussed, and probably with none anywhere.

At the eastern entrance to the bay I was surprised to find last

August no less than three species of *Botrychium* growing in the sand, just beyond the beach. They were never within reach of the salt water, but were however most abundant only about ten yards above the reach of ordinary high tides, where they must be exposed to spray during storms. In other terms, they were among the plants which formed the first fringe of vegetation along the coast, excepting those which actually grew on the beach, and these were very few. By far the most common species was *B. neglectum* Wood, the others were *B. lanceolatum* (Gmel.) Ångs., and *B. Matricariae* (Schrank) Spreng. In the course of seventeen days spent in this general region, on shore and on the islands, I did not find elsewhere either of the first two species, and of the last only three plants together, on a rocky point at the head of the bay. At the place where the Botrychiums were found, I was nowhere far from the shore, but in other places I was far inland and never found any trace of these species, except as stated. All the material collected was submitted to Professor L. M. Underwood for specific determination. Professor M. L. Fernald has since informed me that he has on several occasions found Botrychiums in similar situations on the south shore of the Gulf.

C. B. Robinson.

New York Botanical Garden.

Schreiner and Reed on Deleterious Excretions by Roots. — In the June issue of the *Bulletin of the Torrey Botanical Club* Messrs. Schreiner and Reed contribute the results of a very interesting series of experiments which were designed to test the existence or otherwise of obnoxious substances excreted from the roots of plants. If I venture to draw attention to what seems to be a fallacy, I trust it may not be considered as carping criticism. For not only is their method of experiment ingenious, but it must be generally admitted that there is a very real problem to be solved regarding the relation of one field crop to another. The fallacy to which I draw attention is this : The authors designed their apparatus so that if a substance should form about the roots, it might have an opportunity of diffusing from its more concentrated solution about the roots into a larger body of the

nutrient medium (agar) in the lower part of the apparatus. For this purpose they employed the segmented tubes. At the lower end of the first tube, the substance might diffuse into the surrounding medium; but they assume that the concentration of the toxic substance would be greater in the succeeding tube than in the surrounding medium. This however would not be the case. From the lower end of the first segmented tube as a radius, the substance would diffuse *radially uniformly in all directions* and the concentration in the second tube would be equal to that in the general body of the medium; this state would be altered only *after the roots had commenced to develop in the second tube.* Hence at the time when the roots commenced to grow outside of the general alignment of the tubes, there could be no difference in the concentration of the toxic substance to account for the lateral development.

J. Walter Leather.

Agricultural Research Institute,
Pusa, Bengal.

PROCEEDINGS OF THE CLUB

October 8, 1907

The first autumn meeting for the year 1907 was held at the American Museum of Natural History. The meeting was called to order at 8:30 by the secretary, and Dr. E. B. Southwick was elected chairman. Eleven persons were present.

The minutes for the preceding meeting, on May 29, 1907, were read and approved, and the name of Dr. Forrest Shreve was presented for membership. The resignation of Miss Edith B. Brainerd was read. On motion the secretary cast the vote of the club electing Dr. Shreve to membership.

The announced program consisted of informal reports upon the summer's work and observations. In response to calls by the chairman the following members made remarks:

C. Stuart Gager: Remarks on the absence of undergrowth in a hemlock forest.

Hemlock seeds germinate freely under the parent trees, but seldom attain a height of more than three or four inches. It

was suggested that there may be present in the soil a substance or substances secreted by the hemlock roots and deleterious to the germination and growth of hemlock seedlings. This, as well as poor insolation, must be considered in attempting to explain why the seedlings fail to develop.

M. A. Howe: Botanical observations made in Pownal, Vt.

Dr. Howe reported his attendance at the annual summer field meeting of the Vermont Botanical Club, which was held in Pownal, the extreme southwestern township of Vermont. In this town are the only known Vermont stations for *Liriodendron Tulipifera*, *Morus rubra*, *Aster sagittifolius*, and several other species of interest.

C. B. Robinson: Plant studies on the northern coast of the Gulf of St. Lawrence.

Dr. Robinson had spent the first two or three weeks of August at Seven Islands, on the northern coast of the Gulf of St. Lawrence, about 325 miles below the city of Quebec. The coast to the east of the bay of Seven Islands is a nearly level sandy plain, but the western side, and the islands across the mouth, are formed of steep crystalline rock, a kind of feldspar. A range of hills attaining 1,700 feet in height runs parallel with the coast about ten miles inland. With the exception of a few plants like *Sibbaldiopsis tridentata*, *Empetrum nigrum*, and *Achillea Millefolium*, the rocks and the sand bore strikingly different floras. There was a tendency in some cases for the species of the woods to invade the sand, bringing there species like *Linnaea americana*, *Moneses uniflora*, and *Peramium ophioides*. Three species of *Botrychium* grew in still more open places on the sand. The flora, at best a scanty one, is particularly poor in trees. The shores are lined by black spruce, and the white spruce is less common. Beginning a short distance from the shore the sand plain becomes a pine barren, with *Pinus Banksiana* as practically the only tree. Two species of paper birch, the fir, larch, aspen, and mountain maple are the only other real trees. It had been hoped that the higher latitude would sufficiently compensate for altitudes lower than those of the hills of Gaspé, and thus give a flora comparable to that of the latter. A few such species

were found, among them *Diapensia lapponica*, *Vaccinium ovalifolium*, *V. uliginosum*, *Comandra livida*, *Euphrasia Randii*, and *Selaginella rupestris*, but the general results in this respect were distinctly disappointing.

W. D. Hoyt: Experiences at the Biological Laboratory of the U. S. Bureau of Fisheries, at Beaufort, N. C.

An account was given of the excellent equipment of the station, and the facilities for research. The richness of the local fauna and the varied flora were noted. The locality abounds in epiphytic plants of numerous species. The speaker's investigations indicate a local algal flora that compares favorably with that of the New England and the Florida coasts. Over 100 species have been found. The latitude of Beaufort appears to be the northern limit of certain southern species and the southern limit of some northern ones. The predominant flora varies greatly, according to the season, southern forms predominating in summer and northern forms in winter.

About 23 miles off the coast and under a depth of 13–14 fathoms, extending about one mile in length and one-half a mile in width, is probably the most northern of the coral reefs. It supports a rich algal flora, consisting almost entirely of southern forms, some of them new to North America.

Miss Pauline Kauffmann: Remarks on the unusual habitats of certain ferns in New Jersey.

Several species have been observed growing in habitats somewhat unusual for the species.

Homer D. House: Observations in western South Carolina, and on the Isle of Palms.

On the Isle of Palms, which is off the coast of South Carolina, several species new to South Carolina, and a probably new species of *Helianthus*, were found.

Tracy E. Hazen: Account of a visit to the experimental garden of President Brainerd, at Middlebury, Vt.

A description was given of President Brainerd's experimental pedigreed cultures of violets. In addition to the remarks concerning the Mendelian studies in *Viola*, attention was called to the fact that, contrary to the general notion, viable seeds were commonly found in the petaliferous flowers of the violet.

Discussion followed the remarks of each speaker.

The Club adjourned at 9:45.

C. Stuart Gager,
Secretary.

NEWS ITEMS

Dr. John Hendley Barnhart has been appointed librarian of the New York Botanical Garden, succeeding Miss Anna Murray Vail, who has felt obliged to give up the position on account of ill health.

Dr. Raymond H. Pond, who has been studying during the past year at the New York Botanical Garden, sailed for Europe on November 7 with the intention of spending several months in visiting German botanical laboratories.

Dr. William A. Murrill, first assistant of the staff of the New York Botanical Garden, visited the Biltmore Forest School, at Biltmore, North Carolina, in October, where he secured collections of Polyporaceae and made some observations on diseases of trees.

In the series of non-technical lectures at Columbia University, descriptive of the achievements of science and modern scholarship, recently inaugurated for the academic year 1907–08, the science of botany will be represented by Professor Herbert M. Richards, whose lecture will be given at 4:10 P. M., December 4, at Havemeyer Hall.

The botanical exploration of the Bahama Islands by the New York Botanical Garden and the Field Museum of Natural History is being continued by an expedition which left New York on November 15. The party, consisting of Dr. Marshall A. Howe and Mr. Percy Wilson, expects to visit some of the southeastern islands of the archipelago.

Dr. Ezra Brainerd, who is well known to botanists by reason of his notable studies of the species of *Viola* and by his additions to the knowledge of the flora of Vermont, has resigned the presidency of Middlebury College, to take effect at the end of the present academic year, when he will have completed forty-four years of service as an officer of that institution, during twenty-three years of which he will have been its president.

Vol. 7 December, 1907 No. 12

TORREYA

A Monthly Journal of Botanical Notes and News

EDITED FOR

THE TORREY BOTANICAL CLUB

BY

MARSHALL AVERY HOWE AND PHILIP DOWELL

JOHN TORREY, 1796–1873

CONTENTS

Published for the Club
At 41 North Queen Street, Lancaster, Pa.
by The New Era Printing Company

[Entered at the Post Office at Lancaster, Pa., as second-class matter.]

THE TORREY BOTANICAL CLUB

OFFICERS FOR 1907

TORREYA is furnished to subscribers in the United States and Canada for one dollar per annum; single copies, fifteen cents. To subscribers elsewhere, five shillings, or the equivalent thereof. Postal or express money orders and drafts or personal checks on New York City banks are accepted in payment, but the rules of the New York Clearing House compel the request that ten cents be added to the amount of any other local checks that may be sent. Subscriptions are received only for full volumes, beginning with the January issue. Reprints will be furnished at cost prices. Subscriptions and remittances should be sent to TREASURER, TORREY BOTANICAL CLUB, 41 North Queen St., Lancaster, Pa., or Columbia University, New York City.

Matter for publication should be addressed to

MARSHALL A. HOWE
New York Botanical Garden
Bronx Park, New York City

TORREYA

December, 1907

Vol. 7. No. 12.

LEUCOLEJEUNEA, A NEW GENUS OF HEPATICAE

By Alexander W. Evans

In the writer's paper on the Lejeuneae of the United States and Canada* three species are referred to the genus *Archilejeunea* and are described and figured under the names *A. clypeata* (Schwein.) Schiffn., *A. Sellowiana* Steph., and *A. conchifolia* Evans. While the close relationship which these species bear to one another is emphasized, attention is called to the fact that they present a number of peculiarities which are not shared by typical members of *Archilejeunea*, and the propriety of retaining them in this genus is questioned. A thorough study of several *Archilejeuneae* from tropical America, where the genus attains its highest development, soon made it evident that the importance of the aberrant characters exhibited by *A. clypeata* and its allies had not been overestimated, and it now seems advisable to separate them generically from *Archilejeunea* and to propose a new genus for their reception. This may be characterized as follows:

Leucolejeunea gen. nov.

Lejeunea *p. p.* G. L. & N. Syn. Hep. 1845.

Lejeunea, subgenus Archi-Lejeunea *p. p.* Spruce, Hep. Amaz. et And. 1884.

Archilejeunea *p. p.* Schiffn. in Engler and Prantl, Nat. Pflanzenfam. 1^3: 130. 1895.

Plants medium-sized to robust, pale-green or glaucous, neither glossy nor pigmented but sometimes becoming brownish with age or upon drying: stems prostrate, copiously and irregularly branched, the branches prostrate or slightly separating from the substratum, similar to the stem: leaves loosely to densely imbri-

* Mem. Torrey Club 8: 113–183. *pl. 16–22.* 1902.

[No. 11, Vol. 7, of Torreya, comprising pages 209–224, was issued November 19, 1907.]

cated, the lobe widely spreading but scarcely falcate, ovate-oblong to subrotund, more or less convex and often revolute at the rounded to very obtuse apex and along the postical side, margin entire or subdenticulate from projecting cells; lobule inflated throughout, the free margin more or less strongly involute to or beyond the apex, the opening into the water-sac being largely formed by the sinus, apical tooth varying from blunt to long-acuminate, hyaline papilla marginal, borne at the distal base of the apical tooth and more or less displaced from the terminal cell; leaf-cells plane or convex, thin-walled or with the free outer walls a little thickened, trigones small, mostly triangular with concave sides, intermediate thickenings occasional or rare; ocelli none: underleaves distant to imbricated, orbicular to reniform, entire, broad and undivided at the rounded apex, abruptly narrowed to subcordate at the base: inflorescence mostly autoicous: ♀ inflorescence sometimes borne on a short branch, sometimes on a leading branch, innovating on one side or occasionally on both, the innovations mostly short and sterile but sometimes again floriferous; bracts similar to the leaves, unequally bifid and complicate, the keel mostly rounded but sometimes narrowly winged; bracteole free, rounded to slightly retuse at the apex, obovate; perianth obovoid, scarcely compressed, rounded to subretuse at the apex with a distinct beak, five-keeled, antical keel low and sometimes indistinct, lateral keels sharp, postical keels rounded to sharp, keels smooth or minutely and irregularly crenulate or denticulate from projecting cells, rarely obscurely winged: ♂ inflorescence occupying a short branch; bracts mostly two to six pairs, imbricated, strongly inflated, slightly and subequally bifid with rounded lobes and a strongly arched keel, diandrous; bracteoles similar to the underleaves but smaller, limited to the base of the spike. (Name from λευκός, white, and *Lejeunea*, in allusion to the pale color of the plants.)

In distinguishing *Archilejeunea* and *Leucolejeunea* from each other the most important of the differential characters are those derived from the vegetative organs and the antheridial spikes. The species of *Archilejeunea*, for example, show a marked distinction between a creeping caudex and secondary stems, whereas in *Leucolejeunea* no such distinction is apparent. In *Archilejeunea* the plants are more or less pigmented, the hyaline papilla of the lobule is borne at the proximal base of the apical tooth, the trigones of the leaf-cells are large and conspicuous, the intermediate thickenings are scattered throughout the lobe, and the

pits are narrow. In *Leucolejeunea*, on the contrary, there is no pigmentation, the hyaline papilla is borne at the distal base of the apical tooth, the trigones are small, the intermediate thickenings are few and far between (except sometimes at the base of the lobe), and the pits are wide. The antheridial spikes in *Archilejeunea* are terminal or intercalary on leading branches and the bracteoles are borne throughout their entire length, while in *Leucolejeunea* the spikes occupy short branches and the bracteoles are limited to the base. In both genera the leaves are rounded to very obtuse at the apex, the underleaves are undivided, the female branch bears one or two subfloral innovations, and the perianth is five-keeled.

It is probable that *Leucolejeunea*, in spite of its undivided underleaves, bears a certain relationship to the genera *Cheilolejeunea* and *Pycnolejeunea* of the Lejeuneae Schizostipae. In some cases it resembles them so strongly in habit and general appearance that it is difficult to distinguish it from them in the field. It differs from *Cheilolejeunea* in its five-keeled perianth and in the structure of the lobule, the hyaline papilla although distal being displaced into the sinus. In *Pycnolejeunea* the papilla is proximal in position.

In addition to the three species already mentioned, *Lejeunea xanthocarpa* Lehm. & Lindenb. and *Lejeunea rotundistipula* Lindenb. may be safely referred to *Leucolejeunea*. The genus is most at home in the tropics, but its range extends well into temperate regions. The first species given below may be designated the type of the genus.

Leucolejeunea clypeata (Schwein.)

Jungermannia clypeata Schwein. Spec. Fl. Amer. Sept. Crypt. Hep. 12. 1821.

Lejeunea clypeata Sulliv. in Gray, Manual, Ed. I. 685. 1848.

Archilejeunea clypeata Schiffn. in Engler & Prantl, Nat. Pflanzenfam. 1^3: 130. 1895.

On rocks and trees. Massachusetts and New York, south to Georgia and Louisiana.

Leucolejeunea unciloba (Lindenb.)

Lejeunea unciloba Lindenb. in G. L. & N. Syn. Hep. 331. 1845.

Lejeunea (*Archi-Lejeunea*) *unciloba* Spruce, Hep. Amaz. et And. 91. 1884.

Archilejeunea unciloba Schiffn. in Engler & Prantl, Nat. Pflanzenfam. 1^3: 130. 1895.

Archilejeunea Sellowiana Steph. Hedwigia **34**: 62. 1895.

On trees and rocks. Rhode Island and Delaware, south to the West Indies, Texas, Mexico, and Brazil.

Within recent years the *Lejeunea unciloba* of Lindenberg has been variously interpreted. Spruce referred to this species a rather robust plant which he had collected in the vicinity of the Amazon. Stephani considered this an error and renamed Spruce's specimens *Archilejeunea Spruceana*.* At the same time he transferred the name *unciloba* to the *Lejeunea* (*Archi-Lejeunea*) *florentissima* of Spruce, thereby reducing this latter species to synonymy. During the past summer the writer had the privilege of examining the specimens of *Lejeunea unciloba* preserved in the Lindenberg herbarium at Vienna, including the material from which the original description was drawn. This study led to a third interpretation of the species. *Lejeunea unciloba* is represented in the Vienna collection by seven specimens, numbered consecutively from 6230 to 6236. These specimens came from the following stations: *6230*, locality not given, *Moritz*; *6231*, Peru; *6232*, Colipa, Mexico, *Liebman*; *6233*, Mirador, Mexico, *Liebman*; *6234*, Brazil (the type material); *6235*, Paramaribo, Dutch Guiana, *Kegel*; *6236*, Mirador, Mexico, *Liebman*. Of these numbers *6235* is marked with an interrogation point and is evidently distinct from the others. It agrees with *Lejeunea florentissima* Spruce and should be referred to this species rather than to *Lejeunea Auberiana* Mont., as Stephani has done.† The other specimens apparently agree with one another, although *6230* and *6231* are in poor condition and make a positive decision on this point impossible. Fortunately the numbers from Brazil and Mexico are more satisfactory and show that *Lejeunea unciloba*

* Hedwigia **34**: 62. 1895.

† L. c. **29**: 21. 1890.

is distinct from both *Archilejeunea Spruceana* and *Lejeunea florentissima.* It agrees, however, in all essential respects, with *Archilejeunea Sellowiana* Steph., a species which was also originally described from Brazilian specimens. It therefore becomes necessary to reduce this latter species to synonymy as indicated above.

Leucolejeunea conchifolia (Evans)

Archilejeunea conchifolia Evans, Mem. Torrey Club **8** : 128. *pl. 17, f. 1–9.* 1902.

On trees. South Carolina to Florida and Alabama.

Leucolejeunea xanthocarpa (Lehm. & Lindenb.)

Jungermannia xanthocarpa Lehm. & Lindenb. in Lehmann, Pug. Plant. **5** : 8. 1832.

Lejeunea xanthocarpa Lehm. & Lindenb. in G. L. & N. Syn. Hep. 330. 1845.

Lejeunea (Archi-Lejeunea) xanthocarpa Pears. Christiania-Vidensk.-Selsk. Forh. **1887**[9] : 4. *pl. 1, f. 14–24.*

Archilejeunea xanthocarpa Schiffn. Conspect. Hepat. Archip. Indici 316. 1898.

On trees. Mexico and the West Indies, south to Peru and Brazil (the type locality) ; Fernando Po, Mount Kilimanjaro, and Cape Colony ; Java. This species will soon be fully described by the writer in another connection.

Leucolejeunea rotundistipula (Lindenb.)

Jungermannia rotundistipula Lindenb. in Lehmann, Linnaea **4** : 360. 1829.

Lejeunea rotundistipula Lindenb. in G. L. & N. Syn. Hep. 331. 1845.

Lejeunea (Archilejeunea) rotundistipula Steph. Hedwigia **29** : 21. 1890.

Apparently on trees. Known only from Cape Colony, the type-locality. Judging from the original specimens in the Lindenberg herbarium, this species is dioicous ; in other respects it shows a close approach to *L. unciloba.*

Yale University.

AN UNDESCRIBED HELICONIA IN THE NEW YORK BOTANICAL GARDEN

By Robert F. Griggs

Bihai geniculata sp. nov.

Plant about 4 m. tall (stem to base of peduncle 2 m., petiole 4–6 dm., blade 12.5 dm.), erect, with the habit of *B. Champneiana* but with only 2–3 leaves to a stalk at a time. Leaf 120–150 cm. long, about 30 cm. wide, oblique, narrowed or rounded at the base, acute or suddenly very short-acuminate at the tip, green and glabrous, main veins 10–13 mm. apart. Inflorescence 20–30 cm. long, red, erect, sessile or on a peduncle up to 15 cm. long, of 9–10 bracts, which are of very unequal ages so that the flowers in the lower are in fruit before the upper open. Rachis nearly straight, stiff, the whole inflorescence including pedicels and flowers covered with a thin soft evanescent tomentum. Branch-bracts (distichous in the bud) becoming three-ranked by the twisting of the rachis, horizontally divaricate at anthesis, later reflexed, about 25 mm. apart; the lowest fertile one 15–25 cm. long, 3 cm. around at the widest part, the upper a little shorter, narrowly triangular, straight-sided, scarcely tapering to the very acute tip; the red of the rachis is continued onto the branch-bracts but they are paler at the base within and without and have an equilateral triangle of yellow, which appears on their sides near the point of attachment and extends nearly to the bottom when young, later disappearing so that they are entirely red after anthesis. Flowers 12–20 in each bract but of very diverse age, so that only about two are in season at once, closely appressed into the channel of the bracts until near anthesis, when they become erect by the upward bending of the pedicel, but quickly deflexed again by a sharp bend of about 90° appearing in the perianth above the ovulary, whence the name *geniculata;* free sepal always on the lower side after deflection and more strongly bent, forming a decided lip; pedicels and ovulary greenish-yellow, sepals yellow, as are the petals except for a bright patch of dark green on the lower edges of the two exposed by the reflexed lip.

The type is growing in the greenhouses of the New York Botanical Garden, *no. 19668*, and herbarium sheets are preserved in the same institution. Its native habitat is unknown. It came from the Department of Parks of the Borough of the Bronx in

FIGURE 1. *Bihai geniculata* Griggs.

1902, where it had been in cultivation for some time. It flowers in December.

Of the older species, *B. geniculata* is most similar to *Bihai brasiliensis* which, however, is smaller, has fewer, ascending, bracts, and quite differently colored flowers. *B. tortuosa* is the only other species known to have a three-ranked inflorescence, which is a character that may be of some taxonomic significance as it involves considerable rearrangement of the bracts, and the inflorescence has been supposed to be truly distichous. But unfortunately it is a character not at all adapted to be preserved in herbarium specimens, and only in those few cases where the species have been studied alive can we find out which are distichous and which three-ranked or irregular.

It is unfortunate that the habitat of the species has been lost track of. The geographical distribution of the various species may have some bearing both on taxonomy and on larger problems of plant geography because of the apparently limited means of distribution possessed by the plant. We have, however, by no means sufficient data on the various species of the group to make any generalizations as to distribution. A large number of the species are known from a single collection, while others, as for example *B. latispatha* and *B. psittacorum*, are so widely distributed and so common that they occur in almost every collection of the genus.

On this account I have thought it worth while to add notes of distribution from several collections which have come within my notice.

Bihai acuminata (Rich.). Near Izabol, Guatemala, alt. circ. 750 feet, *W. A. Kellerman*, Feb. 23, 1907. As nearly as one can tell from dried specimens this plant agrees exactly with *B. acuminata*, which has not previously been reported north of Colombia.

B. Champneiana (Griggs). Los Amates, Guatemala, alt. 295 feet, *W. A. Kellerman*, Feb. 23, 1907. Previously reported up to 4,000 feet. Like the type except for a greenish streak along the keel of the bracts.

B. Collinsiana (Griggs). El Palmar, dep. Quezaltenango,

Guatemala, alt. 2,300 feet, *W. A. Kellerman*, Feb. 11, 1906, *no. 5890;* Jan. 16, 1907, *no. 6073*. Has leaves less glaucous than the type, also more flowers to a bract. The flowers, which were wanting in the type, are lemon-yellow.

B. crassa (Griggs). Near Izabol, Guatemala, alt. circ. 750 feet, *W. A. Kellerman*, Feb. 23, 1907. Previously reported up to 3,000 feet.

B. elongata (Griggs). Monkey Hill, Panama, *Cowell, no. 17*. Previously known from Guatemala alone.

B. humilis (Jacq.). Santa Marta, Colombia, *H. H. Smith, no. 2551*, with the field note " Erect, 6–7 feet. Local on damp hill-sides, generally in second growth or open forest 1,500–4,000 feet. Flowers, June–Sept. Specimen is from Don Amo. 2,000 feet. Flower greenish, bract red, edge above and apex green." This specimen has the typical short round leaves of *B. humilis* together with the brightly colored inflorescence just as figured by Jacquin.

B. pendula (Wawra). Volcano Santa Maria, Guatemala, alt. 4,500 feet, *W. A. Kellerman*, Jan. 19, 1907, *no. 6076*. Previously reported only from Brazil. These plants are close to the type except in size ; instead of being 3 m. they are nearly 7 m. tall.

B. rostrata (Ruiz & Pavon). Bolivia, *Miguel Bang, no. 2568*. Typical.

B. spissa (Griggs). Huatusco, Mexico, alt. circ. 6,000 feet, *Fred. Mueller*, 1853, *no. 401*. This station is very far north and at a great altitude for a tropical plant.

Ohio State University,
Columbus, Ohio.

THE GENUS SHORTIA

By Homer Doliver House

The story of the elusive *Shortia galacifolia* of the southern Appalachian mountains is one of the most interesting chapters in American botanical history. The plant was discovered by Michaux more than a hundred years ago, but in fruit only, and remained unknown to other botanists until detected by Asa Gray in the Michaux herbarium in Paris in 1839. Upon his return to

America Dr. Gray made a journey through the mountains of North Carolina, but did not succeed in rediscovering the plant, in spite of which, however, he described and named it after Dr. Short, in 1842. It was not until 1879 that it was rediscovered, and in the meantime not a few botanists had searched for it in vain. The rediscovery was made by M. E. Hyams, in McDowell County, North Carolina, but this station was soon exterminated. In 1886, Professor C. S. Sargent and Mr. F. E. Boynton discovered a new station for the plant on the headwaters of the Keowee River, and in the spring of 1887 Mr. T. G. Harbison, after a careful exploration of the region, found it in great abundance in several localities in the Jocassee Valley and especially along the Whitewater and Toxaway creeks in South Carolina. In spite of its abundance in localities, its distribution is extremely limited, and its ornamental value, which has made it one of the important plants of American horticulture, might easily lead to its extermination. As the plant is now common in nurseries and can be obtained cheaply, it is probably not in immediate danger.

The name of the plant, fittingly commemorative of the name and botanical work of Dr. Short, unfortunately cannot be maintained, as there exists a previously named genus *Shortia*, published by Rafinesque, in an obscure publication, Autikon Botanicon, of 1840. Rafinesque bases his genus *Shortia* upon *Arabis dentata*.

Mr. W. L. Sherwood, of New York, has about 12,000 plants of *Shortia galacifolia* growing upon his place at Highlands, North Carolina, where Mr. Harbison is horticulturist. Mr. Sherwood's unique and valuable library of botanical works has been of considerable help to the writer upon many occasions, and in renaming the genus it seems fitting to dedicate it to him.

In addition to the present species, there exist three other members of the genus in China and Japan.

Sherwoodia nom. nov.

Shortia Torr. & Gray, in Am. Journ. Sci. I. **42**: 48. 1842.— II. **45**: 402. 1868. Proc. Am. Acad. **8**: 246. Syn. Fl. N. Am. **2**: 53. 1878.

Not *Shortia* Raf. Autikon Botanikon 16. 1840.

Sherwoodia galacifolia (Torr. & Gray) nom. nov.

Shortia galacifolia Torr. & Gray, in Am. Journ. Sci. I. **42**: 48. 1842.

The story of this species is given by C. S. Sargent, together with an illustration, in *Garden & Forest* for December, 1888; by Geo. Vasey in the First Report of the Secretary of Agriculture, 387, *pl. 11.* 1889; and by Alice Lounsberry in Southern Wild Flowers and Trees. 1901.

Sherwoodia uniflora (Maxim.) nom. nov.

Schizocodon uniflorus Maxim. Bull. Acad. Petersb. **12**: 71. 1868.

Shortia uniflora Maxim. l. c. **16**: 225. 1871. W. Wats. in Bot. Mag. *pl. 8166.* 1907.

Native of Japan. Duplicate types, collected by *Maximowicz* in prov. Senano and Nambu, Nippon, are in the Columbia University Herbarium.

Sherwoodia rotundifolia (Maxim.) nom. nov.

Schizocodon rotundifolius Maxim. l. c. **22**: 497. 1888.

Shortia rotundifolia Makino, in Tokyo Bot. Mag. **9**: 103. 1895.

Yayeyama Islands, Japan.

Sherwoodia sinensis (Hemsley) nom. nov.

Shortia sinensis Hemsley, in Hook. Ic. Pl. *pl. 2624.* 1899.

Menytze, Yunnan, China, *Henry 11490.* Duplicate type in the herbarium of the New York Botanical Garden.

New York Botanical Garden.

CRATAEGUS IN NEW MEXICO

By W. W. Eggleston

This group is scarce in this region, being found only in the mountains at high altitudes. The herbarium of the New Mexico Agricultural College contains *Crataegus rivularis* Nutt. and *Crataegus erythropoda* Ashe (*C. Cerronis* Nelson) from central New Mexico, which extends their range much farther south than previously reported. The surprising thing to me was a species of

the group Tenuifoliae. This group has not been known before west of the Mississippi River; but this discovery is only in line with facts recently ascertained in regard to the high altitudes of New Mexico, namely, that many of the plants of our northeastern flora, or closely allied species, occur there at altitudes above 2,400 meters. For this information I am indebted to Professor V. M. Spaulding, of the Desert Botanical Laboratory.

This species of the Tenuifoliae can be characterized as follows:

Crataegus Wootoniana sp. nov.

Leaves ovate, 2–4.5 cm. long, 1.5–4.5 cm. wide, acute at the apex, broadly cuneate or truncate at the base, serrate or doubly serrate with fine straight teeth and 3–4 pairs of broad acute straight lobes, membranaceous, glabrous, dull light-green above, paler below; petioles slender, 1–2 cm. long: corymbs many-flowered, glabrous; flowers about 1 cm. wide; calyx glabrous, calyx-lobes lanceolate-acuminate, entire, about 4 mm. long, pink, persistent, erect or spreading in fruit; stamens about 10; styles 3–4: fruit ellipsoidal, red, 6–10 mm. thick, 8–12 mm. long; nutlets usually 3, strongly ridged on the back, 5–7 mm. long; nest of nutlets 5–6 mm. thick. A shrub sometimes 3 meters high, armed with curved spines 2–4.5 cm. long, vegetative twigs glabrous, reddish-brown becoming ash-gray.

Specimens examined: *584, O. B. Metcalfe*, Mogollon Mts., on or near the west fork of the Gila River, Socorro Co., New Mexico; "Head of Little creek. Scarce. A shrub 10 ft. high, Aug. 23, 1903, 8,000 ft.;" type in the Gray Herbarium, cotypes (used in the description), sheets of the same number in the herbaria of the New York Botanical Garden, U. S. National Museum, and of the New Mexico Agricultural College; type of flowers, *182, Turner*, White Mts., Lincoln Co., New Mexico, North Eagle, 1½ miles above forks, May 22, 1899, 8,000 ft.

New York Botanical Garden.

REVIEWS

Punnett's Mendelism*

The first edition of this essay was printed in May, 1905, and the second revised edition in February, 1907. The outline of

* Punnett, R. C. Mendelism. Second Edition. Pp. viii + 85, *f.* 7. Cambridge: Macmillan and Bowes; London: Macmillan and Co., Ltd. 1907.

Mendel's theory is preceded by a brief biographical note on its author. In this edition some of the newer developments, such as Bateson's "Presence and Absence Hypothesis," the newer conception of "reversion," and the phenomena of "dihybridism," supplanting the older conceptions of synthesis and the compound allelomorph, are included, bringing the treatment quite up to date. The statement of the general theory is clear and interesting, its practical bearings are indicated, and in a "Note" at the end directions are given for those who may wish to repeat Mendel's experiments. The seven diagrams are specially helpful.

It seems unfortunate that a work, otherwise so admirable, should be marred by a botanical morphology long since abandoned. Thus, on pages 16, 17, and 82, the stamens are referred to as the "male" and the pistil as the "female" organs of the flower. On page 19 the pollen-grain is described as a "minute male cell" and homologized with the spermatozoön of animals; and again, on page 20, the zygote is said to develop into the adult organism by "a process of repeated nuclear division," omitting cell-division entirely.

With the exception of these minor points, it seems difficult to imagine how the work could have been done much better. Teachers, especially, should welcome the book most heartily.

C. Stuart Gager.

PROCEEDINGS OF THE CLUB

October 30, 1907

The meeting was held in the Museum Building of the New York Botanical Garden. The Club was called to order by the secretary at 3:55 o'clock, and Dr. John Hendley Barnhart was elected chairman. Twenty-two persons attended.

After the reading of the minutes for October 8, 1907, the following names were proposed for membership:

Mr. F. E. Fenno, Nichols, N. Y.; Mr. Morris Friedman, 2874 Briggs Ave., Bronx, N. Y. City; Miss Lillian Belle Sage, 34½ East 12th St., N. Y. City.

The question of omitting the regular meeting for November 27

(the day before Thanksgiving) was discussed, and a motion to omit that meeting was lost.

The resignation of Dr. William Austin Cannon was read and accepted, subject to the approval of the treasurer. On motion, the secretary cast the vote of the Club, electing to membership the persons proposed as above.

The following program was presented:

N. L. Britton: Botanical exploration in Jamaica.

Dr. Britton described his recent trip to the Island of Jamaica, where he with Mrs. Britton spent the month of September in exploring the south-central portion of Jamaica, in coöperation with Hon. William Fawcett, Director of Public Gardens and Plantations, and Mr. William Harris, Superintendent of Public Gardens. Collections aggregating about one thousand field numbers were made in the vicinity of Kingston, in the vicinity of Mandeville, on the Santa Cruz mountains and the Pedro plains lying between these mountains and the southern coast. The coast and morasses about Black River and Lacovia were examined; and another base was made at New Market, on the western border of the parish of St. Elizabeth, whence the hill country of the vicinity and of Eastern Westmoreland were explored. A stop was made also at Bluefields on the southern coast.

The region explored had been little collected in since the visit of William Purdie, an English collector sent to Jamaica from the Royal Gardens, Kew, in 1843 and 1844; and many species not collected by Mr. Harris in his recent work were obtained. Specimens of a considerable number of the more interesting trees and shrubs obtained were exhibited.

P. A. Rydberg: Remarks on the Water-weed, *Philotria*.

The genus was first described in Michaux's Flora Boreali-Americana under the name *Elodea*. Unfortunately this is antedated by *Elodes* Adanson. *Elodea* is characterized as having hermaphrodite flowers with three stamens and three bifid styles. Muhlenberg, in his catalogue, referred the plant to the Old World *Serpicula verticillata* L., now *Hydrilla verticillata*, and characterized the plant as being dioecious with 4-merous staminate flowers. Pursh, in his Flora, retains the plant in *Serpicula*, but

publishes it under a new specific name, *S. occidentalis*. His description agrees in every respect with that of Michaux, except that the leaves are described as linear, acute, and finely serrulate. Rafinesque, in reviewing Pursh's Flora in the *American Monthly Magazine*, criticized Pursh's treatment of the plant and proposed a new name *Philotria*, under which the plant is now to be known. Nuttall, in his Genera, proposes another new name *Udora*, and cites *Elodea* Michx. as a synonym, but describes the plant as being dioecious, the staminate flowers as having nine stamens and the pistillate as having three sterile filaments and three ligulate bifid stigmas. He added also: "flowers very small and evanescent, the female emerging; the male migratory, breaking off connection usually with the parent plant, it instantly expands to the light, the anthers also burst with elasticity and the granular pollen vaguely floats upon the surface of the water." Torrey, in the Flora of New York, describes *Udora* as being polygamous, the sterile flowers with nine stamens, the fertile ones with three to six stamens and cuneiform two-lobed stigmas.

How are these conflicting descriptions to be reconciled? Have some of the authors mentioned given erroneous descriptions? Are there more than one species which have been confused, or is *Philotria canadensis* such a variable plant both as to flowers and leaves? If there are more than one species, are they all polygamo-dioecious with three kinds of flowers: staminate with very short perianth-tube and nine stamens, pistillate ones with long tube and no stamens or merely rudimentary filaments, and hermaphrodite flowers similar to the pistillate ones but somewhat larger and with three to six stamens? These are questions to be answered, and botanists who have an opportunity to study the plants are invited to make thorough field study on these interesting water-weeds.

The study, as far as it has been done now, has given the following suggestions and conclusions, drawn mostly from the literature on the subject and from herbarium material. There seem to be more than one species, probably six or seven. As far as the material on hand shows, the plant with broad and obtuse leaves, originally described as *Elodea canadensis*, seems to be

hermaphrodite; the others all dioecious, not polygamous. The plant that is growing in Europe, supposed to have been introduced from America, and described as *Anacharis Alsinastrum* Babington, resembles *E. canadensis* in habit, but only pistillate flowers have been found, and in these the stigmas are entire. In the North American forms with dioecious flowers the staminate sheaths are sessile in the axils of the leaves and easily overlooked, except in the plant common in the Rocky Mountain region and one specimen from Tennessee, in which the sheaths are peduncled. In the Rocky Mountain plant the staminate flowers are apetalous.

The subject will be more fully discussed in a paper which Dr. Rydberg is preparing to publish in the *Bulletin* of the Club, as soon as more material has been consulted and certain questions can be answered more definitely.

Both papers were briefly discussed and adjournment was at 5:30 o'clock.

C. Stuart Gager,
Secretary.

November 12, 1907

The Club met at the American Museum of Natural History, November 12, 1907. The meeting was called to order by Dr. J. H. Barnhart. Dr. E. B. Southwick was elected chairman. In the absence of the secretary, Miss W. J. Robinson was elected secretary *pro tem.* Eleven persons were present.

After the minutes of the previous meeting were read and approved, the name of Mr. Bertram F. Butler was presented for membership.

The resignation of Dr. W. A. Bastedo was read and accepted, subject to the approval of the treasurer.

The secretary was instructed to cast the vote of the Club for the election of Mr. Butler to membership.

The following scientific program was presented:

Winifred J. Robinson: Demonstration of regeneration in *Drosera.*

Miss Robinson observed regeneration in the leaves of plants of *Drosera rotundifolia* which she had under observation for experi-

mental purposes, at the propagating house of the New York Botanical Garden, in August, 1907. Young plants appeared upon old and apparently dead leaves, which were attached to the plant and were at first thought to be seedlings that had penetrated the leaf-tissue in their growth. Sections showed that this was not the case, but that the young plant grew from the cells of the old tissue, which had remained in an embryonic condition. No formation of callus was observed. Regeneration occurred with equal facility from blade or petiole of the leaf or from the flower-stalk. The first leaves of the young plant bear no tentacles, but later leaves are exactly like those of the parent plant. The roots appear after the stem has attained some size and are at first diageotropic but later bend toward the substratum.

Drosera is not mentioned in recent literature upon regeneration, but Spencer, in his "Principles of Biology," 1867, referred to the subject as a matter of common knowledge. Naudin recorded the appearance of a bud upon the upper surface of the leaf of *D. intermedia* in Ann. Sci. Nat. II. **14**: 14. *pl. 1. fig. 6.* 1840. Planchon gave his observations upon certain "monstrous flowers" of *D. intermedia* in Ann. Sci. Nat. III. **9**: 86. *pl. 5 & 6.* 1853. His observations were verified by various later writers. The most extended study of regeneration in *D. rotundifolia* was made by Nitschke, professor at Westphalia, whose investigations were printed in the Bot. Zeit. 8: 237, 239, 245. 1860. He studied plants in the bogs and observed that the age of a plant could be determined by the successive rings of young plants about it.

Photographs of regenerating plants and of sections showing the relation of the regenerating tissue to the parent plant were shown, also specimens in alcohol, demonstrating the origin of young plants from petiole and blade of leaf and from the flower stalk.

Norman Taylor: Notes on *Tumboa* (*Welwitschia*).

After a short account of the history and synonymy of *Tumboa Bainesii* (*Welwitschia mirabilis*), a general description of the mature plant was given. Attention was called to the peculiar characters of *Tumboa*, which is exogenous in the two cotyledons and the 2–4-merous perianth, endogenous in the parallel-veined leaves

and six stamens, angiospermous in the general structure of the flower, and gymnospermous in the naked ovule and typical "cone" flowers.

Particular mention was made of the seedling, of which there are two now growing at the New York Botanical Garden. In germination the two ligulate cotyledons appear first above the soil, followed by the two nepionic leaves at first erroneously supposed to develop into the only two leaves that the plant ever has during the conjectural one hundred years of its life, but this interpretation of the foliage was subsequently corrected in the Genera Plantarum. Photographs were shown illustrating the two cotyledons and also the position and character of the two nepionic leaves. The latter, which will subsequently develop into the long, tentacle-like leaves of the mature plant, are at first small and linear, springing up directly between the cotyledons, which they closely resemble, and at right angles to them. It was noted that sometimes these leaves were pressed close together, and at other times spread as far apart as possible; that is, they were prostrated on each side of the axis of the plant. From being thus flattened out on the soil they would gradually become erect and finally touch their inner surfaces together. In seeking an explanation of this peculiarity several ideas suggested themselves, the true one seeming to be that the movement of the leaves was a direct response to the presence or absence of water. When they were prostrate they were simply wilted, and it was the water that made them stand erect. On account of the typically xerophytic aspect of even these seedling leaves one would not suspect that they were wilted, there being no external evidence of any loss of turgidity, except the change of position above described.

E. L. Morris: Some recent species of *Plantago*.

Plantago is the genus of plants containing our common plantain. Probably these plants are by most people considered nothing more than weeds, but in contrast to these as weeds, there is a large group of species typically at home and indigenous in the semi-arid regions of our West and Southwest. The species were for a long time included under one name, a name which was applied originally to the South American species found only in Patagonia.

The speaker called attention to a series of sheets of some fifteen species, which he stated, were, until 1900, or a few years preceding, classified under the name of *Plantago patagonica* Jacquin, or to speak more definitely, since 1845 there had been but three specific segregations from this composite and decidedly variant group. One of these was described by Dr. J. K. Small, another by Miss A. M. Cunningham, and another by Dr. E. L. Greene. The misapplication of the name of Miss Cunningham's species to a specimen received in exchange led to the study of the group and the segregation of the species into two distinct types, those with relatively long and definitely acute bracts, in distinction from those with typically short and definitely obtuse or rounded bracts. Among the group of perennial species of the genus, reference was made to a species from Mt. Shasta, formerly included in a species typical of only the extreme Southwest. Reference was then made to a recent species from Alaska, characterized by the marked septation or partitioning of the leaf hairs. A most notable fact regarding this species is that the next important collection of it was made in Montana. It appears that no collections of this species have been made along the Rocky Mountain regions between the Yukon and Montana stations. The last group of species noticed was that belonging to the typical South American subgenus *Plantaginella*, represented there by several species. A species recently reported from Mexico belongs unquestionably to this group, though quite out of its formerly known range. The chief characteristic of this species is the uniflorate spike, which, preceding anthesis, is enclosed within a prominent sheathing bract. Then followed a brief discussion of variation in our common eastern species, the facts being noted that certain forms may soon require a segregation with the rank of species.

A brief discussion followed the presentation of each of the topics of the evening.

Adjournment was at 9:45 o'clock.

WINIFRED J. ROBINSON,
Secretary pro tem.

NEWS ITEMS

Lucien Marcus Underwood, Ph.D., LL.D., Torrey Professor and head of the Department of Botany in Columbia University, chairman of the Board of Scientific Directors of the New York Botanical Garden, vice-president of the Torrey Botanical Club and for five years (1898–1902) editor-in-chief of its publications, died on November 16, at the age of fifty-four years. Professor Underwood was eminent for his work on ferns, liverworts, and fungi, and he was well known to the readers of TORREYA.

About four acres of ground have been recently set apart as a botanic garden for the University of Chicago. This piece of ground is easily accessible from the Hull Botanical Laboratory and is to serve as a laboratory garden where experimental work may be carried on.

We learn from *Science* that by the will of Mrs. Sarah E. Potter, of Boston, Harvard University received in June a bequest of $50,000 to be used in connection with the Gray Herbarium and to be called the Sarah E. Potter endowment fund. "As one of a number of residuary legatees, the university has now received an addition to this endowment of $130,000."

Clark Hall, of the Massachussetts Agricultural College, the new building named after Colonel William Smith Clark, an enthusiastic botanist and one of the first presidents of the institution, was dedicated on October 2. Professor D. P. Penhallow, D.Sc., F.R.S.C., of McGill University, gave an address on "William Smith Clark: his place as a scientist and his relation to the development of scientific agriculture," and Professor John M. Tyler, Ph.D., of Amherst College, spoke on the subject "Reminiscences of Col. W. S. Clark."

INDEX TO VOLUME VII.

New names and the names of new genera and species are printed in **boldface type.**

OTHER PUBLICATIONS

OF THE

TORREY BOTANICAL CLUB

(1) BULLETIN

A monthly journal devoted to general botany, established 1870. Vol. 33, published in 1906, contained 635 pages of text and 26 full-page plates. Price $3.00 per annum. For Europe, 14 shillings. Dulau & Co., 37 Soho Square, London, are agents for England.

Of former volumes, only 24–33 can be supplied entire ; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Vols. 24–27 are furnished at the published price of two dollars each ; Vols. 28–33, three dollars each.

Single copies (30 cts.) will be furnished only when not breaking complete volumes.

(2) MEMOIRS

The Memoirs, established 1889, are published at irregular intervals. Volumes 1–11 and 13 are now completed and Nos. 1 and 2 of Vol. 12 have been issued. The subscription price is fixed at $3.00 per volume in advance. The numbers can also be purchased singly. A list of titles of the individual papers and of prices will be furnished on application.

(3) **The Preliminary Catalogue of Anthophyta and Pteridophyta** reported as growing within one hundred miles of New York, 1888. Price, $1.00.

Correspondence relating to the above publications should be addressed to

THE TORREY BOTANICAL CLUB
Columbia University
NEW YORK CITY

2